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=> FILE REG
FILE 'REGISTRY' ENTERED AT 14:30:25 ON 20 DEC 2006
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=> DISPLAY HISTORY FULL L1-

     FILE 'REGISTRY' ENTERED AT 11:46:53 ON 20 DEC 2006
                 E HYDROGEN/CN
L1             1 SEA HYDROGEN/CN
                 E OXYGEN/CN
L2             1 SEA OXYGEN/CN
                 E WATER/CN
L3             1 SEA WATER/CN
                 E IODINE/CN
L4             1 SEA IODINE/CN
                 E NITROGEN/CN
L5             1 SEA NITROGEN/CN
                 E PHOSPHORIC ACID/CN
L6             1 SEA "PHOSPHORIC ACID"/CN

     FILE 'HCAPLUS' ENTERED AT 11:50:55 ON 20 DEC 2006
L7          5050 SEA BAR ?/AU OR BARGADDA ?/AU OR BAR GADDA ?/AU OR GADDA
                 ?/AU OR GADDA BAR ?/AU
L8        281897 SEA HYDROGEN#/TI
L9        482752 SEA PLASMA#/IT
L10            1 SEA L7 AND L8 AND L9
L11        25868 SEA L3 (L) RACT/RL
L12            0 SEA L10 AND L11

     FILE 'HCA' ENTERED AT 11:56:37 ON 20 DEC 2006
L13        43440 SEA L1/P
L14        21482 SEA L2/P
L15       701106 SEA L3 OR STEAM? OR (WATER? OR H2O OR HOH)(2A)(VAPOUR?
                 OR VAPOR? OR EVAP? OR VOLATILIZ? OR VOLATILIS? OR
                 ATOMIS? OR ATOMIZ? OR MIST OR MISTS OR MISTED OR
                 MISTING# OR SPRAY? OR MICRONIZ? OR MICRONIS? OR GAS## OR
                 GASEOUS? OR GASIF?)
L16       130639 SEA L4 OR I2 OR (MOLECULAR? OR ELEMENTAL? OR PURE# OR
                 PURIF?)(2A)(IODINE# OR I)
L17       462901 SEA L5 OR N2 OR (NITROGEN# OR N)(2A)(GAS## OR GASEOUS?
                 OR GASIF? OR ATM# OR ATMOS?)
L18       147311 SEA L6 OR (PHOSPHORIC# OR ORTHOPHOSPHORIC#)(2A)ACID# OR
                 H3PO4
L19              QUE MEMBRAN?
L20         1010 SEA LAVAL#
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L21      107425 SEA MICROWAV?
L22      107338 SEA RADIOFREQ? OR RADIO#(2A)(FREQ# OR FREQUENC?) OR RF
                OR R(W)F
L23       55749 SEA (ELECTRIC? OR ELEC# OR DISCHARG?)(2A)(ARC OR ARCS)
                OR (GLOW? OR SPARK?)(2A)DISCHARG?
L24       37275 SEA (ELECTROMAG? OR ELECTRO(A)(MAGNET? OR MAG#) OR EM OR
                E(W)M)(2A)(FIELD? OR FLUX? OR WAVE# OR WAVING#)
L25             QUE PLASM#
L26       32996 SEA L3 (L) (PROC# OR PROCESS?)
L27        4036 SEA L13 AND L14
L28         382 SEA L27 AND L26
L29           8 SEA L28 AND L25
L30        2305 SEA L27 AND L15
L31          43 SEA L30 AND L25
L32           0 SEA L31 AND L16
L33           5 SEA L31 AND L17
L34           2 SEA L31 AND L18
L35           5 SEA L31 AND L19
L36           0 SEA L31 AND L20
L37           6 SEA L31 AND ((L21 OR L22 OR L23 OR L24))
L38          13 SEA (L32 OR L33 OR L34 OR L35 OR L36 OR L37)
L39      319842 SEA L1
L40      394274 SEA L2
L41       40452 SEA L39 AND L40
L42        9809 SEA L41 AND L15
L43         532 SEA L42 AND L25
L44         316 SEA L43 AND ((L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR
                L22 OR L23 OR L24))
L45           8 SEA L43 AND L16
L46         241 SEA L43 AND L17
L47           5 SEA L43 AND L18
L48          24 SEA L43 AND L19
L49           0 SEA L43 AND L20
L50         110 SEA L43 AND ((L21 OR L22 OR L23 OR L24))
L51          40 SEA L43 AND L21
L52          30 SEA L43 AND L22
L53          49 SEA L43 AND L23
L54           8 SEA L43 AND L24
L55           4 SEA L48 AND (L51 OR L52 OR L53)
L56          23 SEA L50 AND L26
L57           3 SEA L46 AND L47
L58          18 SEA L29 OR L38
L59          25 SEA L31 NOT L58
L60           0 SEA L59 AND (L45 OR L47 OR L48 OR L54 OR L55 OR L56 OR
                L57)
L61          21 SEA (L45 OR L47 OR L54 OR L55 OR L57) NOT (L58 OR L59)
L62          36 SEA (L48 OR L56) NOT (L58 OR L59 OR L61)
L63          16 SEA 1840-2003/PY,PRY AND L58
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L64 22 SEA 1840-2003/PY,PRY AND L59
L65 19 SEA 1840-2003/PY,PRY AND L61
L66 32 SEA 1840-2003/PY,PRY AND L62

=> FILE HCA
FILE 'HCA' ENTERED AT 14:30:44 ON 20 DEC 2006

=> D L63 1-16 CBIB ABS HITSTR HITIND

L63 ANSWER 1 OF 16 HCA COPYRIGHT 2006 ACS on STN
142:264323 Ecology system focusing on hydrogen use. Yoshino, Kazutora (USA). U.S. Pat. Appl. Publ. US 2005044853 A1 20050303, 14 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-653553 20030902.

AB Ecosystem that is highly efficient and environmental is shown. Turbo Hydrogen engine with controlled combustion using the recycling of uncombusted gases such as hydrogen and oxygen can be embedded to this ecosystem. Solar energy and wind energy can be used as external energy source. The energy of motion of a vehicle is charged back to usable energy when it reduces the motion.

IT **7732-18-5**, Water, **processes**
(ecol. system focusing on hydrogen use)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **7782-44-7P**, Oxygen, preparation
(ecol. system focusing on hydrogen use)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **1333-74-0P**, Hydrogen, uses
(ecol. system focusing on hydrogen use)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IC ICM F03G006-00
INCL 060641800
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 59, 71, 72
IT Fission
Nuclear fusion
Plasma
(engine; ecol. system focusing on hydrogen use)
IT Fuel cells
(**phosphoric acid**; ecol. system focusing on hydrogen use)
IT Fuel cells
(proton exchange **membrane**; ecol. system focusing on hydrogen use)
IT 64-17-5, Ethanol, processes 67-56-1, Methanol, processes 142-82-5, Heptane, processes **7732-18-5**, Water, **processes**
(ecol. system focusing on hydrogen use)
IT 7782-39-0P, Deuterium, preparation **7782-44-7P**, Oxygen, preparation 10028-17-8P, Tritium, preparation 12586-59-3P, Proton
(ecol. system focusing on hydrogen use)
IT **1333-74-0P**, Hydrogen, uses
(ecol. system focusing on hydrogen use)

L63 ANSWER 2 OF 16 HCA COPYRIGHT 2006 ACS on STN
142:117686 Integrated **plasma** fuel cell process. Steinberg, Meyer (USA). PCT Int. Appl. WO 2005004255 A2 20050113, 16 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2004-US20019 20040624. PRIORITY: US 2003-2003/604153 20030627; US 2003-2003/604961 20030828.
AB The invention concerns a method for efficiently producing energy, carbon, carbon monoxide, synthetic carbonaceous liq. and gaseous fuels and hydrogen from fossil or biomass fuels with minimal carbon dioxide and other emissions.
IT **7732-18-5**, Water, **processes**
(integrated **plasma** fuel cell **process**)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT 1333-74-0P, Hydrogen, uses 7782-44-7P, Oxygen, uses
(integrated **plasma** fuel cell process)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM H01M
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 51, 72
ST **plasma** fuel cell process
IT Hydrocarbons, uses
(C1-4; integrated **plasma** fuel cell process)
IT Thermodynamic cycle
(Rankine; integrated **plasma** fuel cell process)
IT Fuel cells
(direct carbon; integrated **plasma** fuel cell process)
IT Fuels
(fossil; integrated **plasma** fuel cell process)
IT Carbonaceous materials (technological products)
(fuels; integrated **plasma** fuel cell process)
IT Biomass
Diesel fuel
Electrolytic cells
Fischer-Tropsch reaction
Plasma
Water gas shift reaction
(integrated **plasma** fuel cell process)
IT Gasoline
(integrated **plasma** fuel cell process)
IT Fuel cells
(solid oxide; integrated **plasma** fuel cell process)
IT Boilers
(steam; integrated **plasma** fuel cell process)
IT **7732-18-5**, Water, **processes**
(integrated **plasma** fuel cell **process**)

IT 67-56-1, Methanol, uses 74-82-8, Methane, uses
(integrated **plasma** fuel cell process)

IT 124-38-9P, Carbon dioxide, uses 630-08-0P, Carbon monoxide, uses
1333-74-0P, Hydrogen, uses 7440-44-0P, Carbon, uses
7782-44-7P, Oxygen, uses
(integrated **plasma** fuel cell process)

L63 ANSWER 3 OF 16 HCA COPYRIGHT 2006 ACS on STN

142:117577 Hydrogen generation by water splitting in a radiant energy transfer reactor. Bar-Gadda, Ronny (Bar-Gadda, LLC, USA). PCT Int. Appl. WO 2005005009 A2 20050120, 35 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2004-US21267 20040630. PRIORITY: US 2003-2003/PV48408U 20030630; US 2003-2003/632708 20030801; US 2004-2004/819591 20040406.

AB Hydrogen is produced by introducing high temp. **steam** or **water vapor** into a radiant energy transfer reactor. The radiant energy is absorbed by the mols. which dissoc. into their constituent mol. elements of hydrogen and oxygen. To prevent recombining of the constituent mol. elements, the hydrogen and oxygen are sepd. from each other by a **membrane**, centrifugation using a variant **electromagnetic field**, or by chem. reaction of one component. The source of **steam** can be geothermal **steam**, or **steam** produced in a boiler using heat from combustion processes. Once sepd., the mol. components are prevented from recombining with each other or with other elements by using std. sepn. techniques normally employed for sepg. dissimilar gaseous species.

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(hydrogen generation by water splitting in radiant energy transfer reactor)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

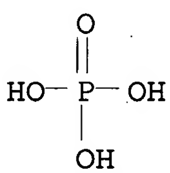
H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

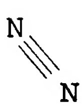
IT **7732-18-5**, Water, **processes**
(hydrogen generation by water splitting in radiant energy transfer reactor)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **7664-38-2**, **Phosphoric acid**, reactions
7727-37-9, Nitrogen, reactions
(hydrogen generation by water splitting in radiant energy transfer reactor)
RN 7664-38-2 HCA
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7727-37-9 HCA
CN Nitrogen (8CI, 9CI) (CA INDEX NAME)



IC ICM B01D
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST hydrogen manuf water splitting **plasma**
IT Combustion enthalpy
Electric arc
Electromagnetic field
Heat transfer
Plasma
Turbines
Waste plastics and rubbers
(hydrogen generation by water splitting in radiant energy transfer reactor)
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**,

Oxygen, preparation
(hydrogen generation by water splitting in radiant energy transfer reactor)

IT 7732-18-5, Water, **processes**
(hydrogen generation by water splitting in radiant energy transfer reactor)

IT 124-38-9, Carbon dioxide, reactions **7664-38-2**, **Phosphoric acid**, reactions **7727-37-9**, Nitrogen, reactions
(hydrogen generation by water splitting in radiant energy transfer reactor)

L63 ANSWER 4 OF 16 HCA COPYRIGHT 2006 ACS on STN
141:280318 Water dissociator for hydrogen use in engines. Konnov, S. V. (Russia). Russ. RU 2230916 C2 20040620, No pp. given (Russian). CODEN: RUXXE7. APPLICATION: RU 2002-116938 20020624.

AB A proposed water dissociator makes it possible to dissoc. water periodically into hydrogen-oxygen gas mixt., expecially for use in engines. The water dissociator contains a nozzle installed in an internal combustion engine cylinder and connected through a pump to a water tank. A device for coupling with a superhigh frequency electromagnetic oscillator is installed in the engine cylinder. A high-speed two-stroke carburetor internal combustion engine is used. This method improves the possibility of dissocn. of water for use in engines.

IT **7732-18-5**, Water, uses
(water dissociator for hydrogen use in engines)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(water dissociator for hydrogen use in engines)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

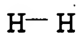
IC ICM F02B047-02
ICS F02M025-03
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST water dissociator **microwave** oscillator internal combustion engine **plasma** fuel
IT Cold **plasma**
(created inside engine cylinder; water dissociator for hydrogen use in engines)
IT Internal combustion engines
Microwave oscillators
Pistons
Valves
(water dissociator for hydrogen use in engines)
IT **7732-18-5**, Water, uses
(water dissociator for hydrogen use in engines)
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(water dissociator for hydrogen use in engines)

L63 ANSWER 5 OF 16 HCA COPYRIGHT 2006 ACS on STN
140:409609 Method for gasification of carbon-containing substances by using **plasma.** Stari, Johannes; Simmel, Johannes (Johann Stari Ges. m.b.H. Sonder- und Spezialmaschinenbau, Austria). PCT Int. Appl. WO 2004041974 A1 20040521, 25 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (German). CODEN: PIXXD2. APPLICATION: WO 2003-AT315 20031020. PRIORITY: AT 2002-1662 20021104.
AB The invention relates to a method for gasification of carbon-contg. substances. The substances are fed into the reactor through a transfer channel. **Plasma** torches for generating a gaseous **plasma** are arranged at the reactor bottom in the direction of gravitation force. The oxidn. products, i.e. clinker, glass, ashes are drawn downward and fed into a solidifier, inside of which the oxidn. products are sepd., subsequently collected in the collecting tank, and transported away when required. The gas produced inside the reactor is fed via line into the gas washer, inside of which the gas is cooled and purified with **sprayed water.** The discharging water is charged via line into the collecting tank, inside of which water is already present so that the clinker, glass or the like can be cooled. The purified gas is fed via line into the compressor, inside of which the gas is

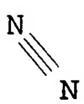
compressed to 2 bar and then purified once more while passing through filter, and is then mixed inside the gas mixer with atm. air. This mixt. of gas and air is then fed via line into the gas engine that drives a generator.

IT **1333-74-0P**, Hydrogen, preparation **7727-37-9P**, Nitrogen, preparation **7782-44-7P**, Oxygen, preparation
(method for gasification of carbon-contg. substances by using **plasma**)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)



RN 7727-37-9 HCA
CN Nitrogen (8CI, 9CI) (CA INDEX NAME)



RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

IC ICM C10J003-46
ICS C10J003-52; B01J019-08; C10J003-18
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fuel gas manufg wood chip gasification **plasma**
IT Abies
Fagus
Larix
Wood
(chips; method for gasification of carbon-contg. substances by using **plasma**)

IT **Plasma**
Plasma torches
(for gasification of carbon-contg. substances by using **plasma**)

IT Fuel gas manufacturing
(gasification, fluidized-bed; method for gasification of carbon-contg. substances by using **plasma**)

IT Fuel gas manufacturing
(gasification; method for gasification of carbon-contg. substances by using **plasma**)

IT 124-38-9P, Carbon dioxide, preparation 630-08-0P, Carbon monoxide, preparation **1333-74-0P**, Hydrogen, preparation **7727-37-9P**, Nitrogen, preparation **7782-44-7P**, Oxygen, preparation
(method for gasification of carbon-contg. substances by using **plasma**)

L63 ANSWER 6 OF 16 HCA COPYRIGHT 2006 ACS on STN

140:273630 Electrochemical generation, storage and reaction of hydrogen and oxygen. Sanders, Nicholas (Diffusion Science, Inc., USA). PCT Int. Appl. WO 2004027901 A2 20040401, 92 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US29802 20030917. PRIORITY: US 2002-411443P 20020917; US 2003-455215P 20030317.

AB The invention concerns an electrolytic app. for using catalyst-coated hollow microspheres to produce gases, store them, and to make them available for later use. The app. uses catalyst-coated hollow microspheres in reversible electrochem. processes and reactions, such as those used in conjunction with water dissocn., fuel cells, and rechargeable batteries. The app. can be used to manuf. and store hydrogen and or oxygen and to make them available for subsequent use as raw materials for use in electrochem. and chem. reactions or as a fuel and or oxidizer for a combustion engine. The app. can be used as a hydrogen-oxygen hermetically sealed secondary battery. The app. can be used as a hydrogen storage portion of certain types of secondary batteries. Hydrogen and oxygen can be stored within hollow microspheres at moderate temp. and pressure, eliminating the need for expensive storage and handling equipment, and increasing the mobility of hydrogen-powered vehicles. Storage of hydrogen and or oxygen within the microspheres significantly reduces flammability and explosion concerns and resolves many fuel cell scalability issues.

IT **7732-18-5**, Water, **processes**
(electrochem. generation, storage and reaction of hydrogen and oxygen)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(electrochem. generation, storage and reaction of hydrogen and oxygen)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM H01M004-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57, 72

IT Vapor deposition process
(**plasma**; electrochem. generation, storage and reaction of hydrogen and oxygen)

IT **7732-18-5**, Water, **processes**
(electrochem. generation, storage and reaction of hydrogen and oxygen)

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(electrochem. generation, storage and reaction of hydrogen and oxygen)

L63 ANSWER 7 OF 16 HCA COPYRIGHT 2006 ACS on STN

139:166829 Hydrogen generation from water, methane, and methanol with nonthermal **plasma.** Kabashima, Hajime; Einaga, Hisahiro; Futamura, Shigeru (National Institute of Advanced Industrial Science and Technology, Ibaraki, 305-8569, Japan). IEEE Transactions on Industry Applications, 39(2), 340-345 (English) **2003.** CODEN: ITIACR. ISSN: 0093-9994. Publisher: Institute of Electrical and Electronics Engineers.

AB Hydrogen generation from water, methane, and methanol was studied with different types of nonthermal **plasma** reactors under different conditions. With a ferroelec. packed-bed reactor in **N2**, hydrogen gas yield decreased in the order: methanol > methane > water. A similar trend was obsd. with a silent discharge **plasma** reactor, but H2 yields were much lower with the latter reactor. At fixed specific energy densities, higher H2 yields were obtained at higher gas flow rates in the reactions of the above substrates. The initial water concn. was optimized at .apprx.2.0% to obtain the highest rate for H2 formation. Under the

same conditions, H_2 yield decreased in the order: Ar > **N2** > air ≈ O_2. The ferroelec. packed-bed reactor could be operated continuously for 10 h without any decrease in its performance in the H_2 generation from water.

IT **1333-74-0P**, Hydrogen, preparation
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7782-44-7P**, Oxygen, preparation
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **7727-37-9**, Nitrogen, uses
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)
RN 7727-37-9 HCA
CN Nitrogen (8CI, 9CI) (CA INDEX NAME)

N≡N

IT **7732-18-5**, Water, reactions
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
ST hydrogen water methane methanol nonthermal **plasma** ferroelec bed packing; **plasma** silent discharge reactor hydrogen controlled atm effect
IT Hydrocarbons, formation (nonpreparative)
(C2; hydrogen generation from water, methane, and methanol with

nonthermal **plasma**)

IT Air
Controlled atmospheres
Decomposition
Ferroelectric materials
Plasma
Reaction mechanism
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT Reactors
(packed-bed; hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT Reactors
(**plasma**; hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT Electric discharge
(silent, tubular; hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT 12047-27-7, Barium titanium trioxide, uses
(bed packing; hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT 630-08-0P, Carbon monoxide, preparation
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT 74-82-8P, Methane, preparation
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT 67-56-1, Methanol, processes
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT 74-84-0, Ethane, formation (nonpreparative) 74-85-1, Ethene, formation (nonpreparative) 74-86-2, Acetylene, formation (nonpreparative) 124-38-9, Carbon dioxide, formation (nonpreparative)
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT **1333-74-0P**, Hydrogen, preparation
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT **7782-44-7P**, Oxygen, preparation
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

IT 7440-37-1, Argon, uses **7727-37-9**, Nitrogen, uses
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

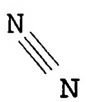
IT **7732-18-5**, Water, reactions
(hydrogen generation from water, methane, and methanol with nonthermal **plasma**)

L63 ANSWER 8 OF 16 HCA COPYRIGHT 2006 ACS on STN
131:292518 Electricity feeders for water electrolytic cells. Shinohara, Taizo; Yamaguchi, Mikimasa (Fuji Electric Corporate Research and Development, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11302891 A2 **19991102** Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-114476 19980424.

AB The electricity feeder is made of a Ti fiber-sintered plate whose surface is made smooth by **plasma** thermal spray of Ti in an inert gas (Ar, He, or **N**) **atm.** The durability of **membrane** electrode joined body is improved thus efficient water electrolytic cells can be provided.

IT **7727-37-9**, Nitrogen, uses
(electricity feeder made of a Ti fiber-sintered plate whose surface is made smooth by **plasma** thermal spray of Ti in an inert gas (Ar, He, or **N**) **atm.**)

RN 7727-37-9 HCA
CN Nitrogen (8CI, 9CI) (CA INDEX NAME)



IT **7732-18-5**, Water, **processes**
(electricity feeders for water electrolytic cells)

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(electricity feeders for water electrolytic cells for prodn. of)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM C25B009-04

ICS C23C004-12; C25B009-00
CC 72-3 (Electrochemistry)
Section cross-reference(s): 49
IT 7440-32-6, Titanium, uses
(electricity feeder made of Ti fiber-sintered plate whose surface is made smooth by **plasma** thermal spray of Ti in an inert gas (Ar, He, or **N**) **atm.**)
IT 7440-37-1, Argon, uses 7440-59-7, Helium, uses **7727-37-9**
, Nitrogen, uses
(electricity feeder made of a Ti fiber-sintered plate whose surface is made smooth by **plasma** thermal spray of Ti in an inert gas (Ar, He, or **N**) **atm.**)
IT **7732-18-5**, Water, **processes**
(electricity feeders for water electrolytic cells)
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**,
Oxygen, preparation
(electricity feeders for water electrolytic cells for prodn. of)

L63 ANSWER 9 OF 16 HCA COPYRIGHT 2006 ACS on STN
125:333967 Direct solar-thermal hydrogen production from water using nozzle/skimmer and **glow discharge.** Pyle, W. R.; Hayes, M. H.; Spivak, A. L. (H-Ion Solar Co., Richmond, CA, 94805, USA). Proceedings of the Intersociety Energy Conversion Engineering Conference, 31st, 1753-1760 (English) **1996.** CODEN: PIECDE. ISSN: 0146-955X. Publisher: Society of Automotive Engineers.
AB An investigation of direct solar-thermal hydrogen and oxygen prodn. from water is described. Nozzle jets and skimmers have been used for sepn. of the products and suppression of recombination. The dissocn. of **water vapor** and the sepn. of its products was conducted in **plasma**-enhanced, non-equil. **glow discharges.**
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**,
Oxygen, preparation
(direct solar-thermal hydrogen prodn. from water using nozzle/skimmer and **glow discharge**)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **7732-18-5**, Water, reactions
(direct solar-thermal hydrogen prodn. from water using nozzle/skimmer and **glow discharge**)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
ST solar thermal hydrogen prodn water; nozzle skimmer **glow discharge** hydrogen prodn
IT Solar energy
(direct solar-thermal hydrogen prodn. from water using nozzle/skimmer and **glow discharge**)
IT Electric **discharge**
(**glow**, direct solar-thermal hydrogen prodn. from water using nozzle/skimmer and **glow discharge**)
IT Nozzles
(jet, direct solar-thermal hydrogen prodn. from water using nozzle/skimmer and **glow discharge**)
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(direct solar-thermal hydrogen prodn. from water using nozzle/skimmer and **glow discharge**)
IT **7732-18-5**, Water, reactions
(direct solar-thermal hydrogen prodn. from water using nozzle/skimmer and **glow discharge**)

L63 ANSWER 10 OF 16 HCA COPYRIGHT 2006 ACS on STN
123:68427 Development of vacuum **plasma** sprayed electrodes for an intermittently operated alkaline water electrolyser. Schiller, G.; Borck, V.; Henne, R.; Hug, W. (Deutsche Forschungsanstalt fur Luft- und Raumfahrt (DLR), Institute Technical Thermodynamics, Stuttgart, 70569, Germany). Hydrogen Energy Prog. X, Proc. World Hydrogen Energy Conf., 10th, Volume 1, 631-9. Editor(s): Block, David L.; Veziroglu, T. Nejat. Fla. Sol. Energy Cent.: Cape Canaveral, Fla. (English) **1994.** CODEN: 61FXA7.
AB Activated electrodes for advanced, intermittently operated alk. water electrolysis were developed by applying the vacuum **plasma** spraying technol. (VPS). For hydrogen evolution cathode coatings from Mo-contg. Raney nickel were used, and as anodes matrix composite coatings consisting of Raney nickel and Co3O4 electrocatalyst are applied. To test the electrodes for intermittent operation small electrolyzers with zero gap design were equipped with VPS electrodes of an area of 250 cm2 and NiO diaphragms. The electrochem. activity and the long-term degrdn. behavior of the electrodes were studied by applying const. c.d. as

well as a real solar c.d. profile. Polarization curve measurements in dependence of temp. were performed and single electrode potentials were detd. At std. conditions (300 mA/cm2, 80°) cell voltage was in the range of 1.6 V. During various operation modes with const. and intermittent power supply cell voltage was monitored up to 5000 h of operation showing stable behavior during the whole period of study without evidence of degrdn. The next step in the development of VPS electrodes is the prodn. of electrodes with an area of 600 cm2 which are currently prepd. to be tested in an intermittently operated 10 kW electrolyzer of advanced technol.

IT **7732-18-5**, Water, **processes**
    (development of vacuum **plasma** sprayed electrodes for intermittently operated alk. water electrolyzer)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, properties **7782-44-7P**, Oxygen, properties
    (development of vacuum **plasma** sprayed electrodes for intermittently operated alk. water electrolyzer)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 72-2 (Electrochemistry)
    Section cross-reference(s): 49
ST vacuum **plasma** sprayed electrode water electrolysis
IT Electrodes
    (vacuum **plasma** sprayed)
IT **7732-18-5**, Water, **processes**
    (development of vacuum **plasma** sprayed electrodes for intermittently operated alk. water electrolyzer)
IT **1333-74-0P**, Hydrogen, properties **7782-44-7P**, Oxygen, properties
    (development of vacuum **plasma** sprayed electrodes for intermittently operated alk. water electrolyzer)

L63 ANSWER 11 OF 16 HCA COPYRIGHT 2006 ACS on STN
121:233994 Magnetohydrodynamic (MHD) process for the manufacture of hydrogen. Giannotti, Pedro (Brazil). Braz. Pedido PI BR 9204950 A **19940614**, 10 pp. (Portuguese). CODEN: BPXXDX.
APPLICATION: BR 1992-4950 19921209.
AB The process comprises introducing water into a MHD reactor through a small bottom tube equipped with a needle valve and rotameter for flow control, ionizing the water with an electron beam in an elec. field to form a low-resistance elec. conductive **plasma** and sepg. the ions and electrons by elec. and magnetic forces to recover O at one side and H at the other side.
IT **7732-18-5**, Water, reactions
(in MHD **process** for the manuf. of hydrogen)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(in MHD process for water dissocn)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM C01B003-06
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 77
IT **7732-18-5**, Water, reactions
(in MHD **process** for the manuf. of hydrogen)
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(in MHD process for water dissocn)

L63 ANSWER 12 OF 16 HCA COPYRIGHT 2006 ACS on STN
121:45138 Contact **glow discharge** electrolysis: a study of its chemical yields in aqueous inert-type electrolytes. Sengupta, Susanta K.; Singh, Om Prakash (Department of Chemistry, Faculty of Science, Banaras Hindu University, Varanasi, 221005,

India). Journal of Electroanalytical Chemistry, 369(1-2), 113-20 (English) **1994.** CODEN: JECHES. ISSN: 0368-1874.

AB A study of the chem. yields of contact **glow discharge** electrolysis (CGDE) at the anode in aq. inert electrolytes at various quantities of electricity, applied voltages and electrolyte compns. shows that, for the passage of each mole of electrons, 0.25 mol of O2 and more than 1.0 mol of both H2 and H2O2 plus O2 are produced at the anode when the **glow discharges** there are fully grown. Non-faradaic yields may originate in two reaction zones: the anolyte near the **plasma** where liq. water mols. are broken up into H2O2, O2 and H2, and the **plasma** around the anode where gas phase dissocn. of water mols. into H2 and O2 occurs. The former is important for anodic CGDE. Hickling's radiolytic mechanism has been applied to interpret the chem. results of the liq. phase reaction zone. A comparative study of the chem. yields of anodic and cathodic CGDE indicates that the breakup of water mols. occurs entirely in the **plasma** during cathodic CGDE, but primarily in the liq. anolyte and partly in the **plasma** during the anodic phenomenon.

IT **7732-18-5**, Water, reactions
(contact **glow discharge** electrolysis of, in aq. electrolytes)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(evolution of, in contact **glow discharge** electrolysis of water)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 72-11 (Electrochemistry)
Section cross-reference(s): 76

ST electrolysis **glow discharge** water; oxygen hydrogen peroxide formation water electrolysis; radiolysis Hickling

mechanism water electrolysis
IT Radiolysis
(Hickling mechanism of, for water contact **glow discharge** electrolysis)
IT Electrolysis
(contact **glow discharge**, of aq. solns.)
IT **Plasma**
(in contact **glow discharge** electrolysis of water)
IT Electric **discharge**
(**glow**, in water electrolysis)
IT 7778-80-5, Dipotassium sulfate, reactions
(contact **glow discharge** electrolysis of aq., oxygen and hydrogen and hydrogen peroxide formation in)
IT **7732-18-5**, Water, reactions
(contact **glow discharge** electrolysis of, in aq. electrolytes)
IT 7440-06-4, Platinum, uses
(electrode, for contact **glow discharge** electrolysis of water)
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(evolution of, in contact **glow discharge** electrolysis of water)
IT 7722-84-1P, Hydrogen peroxide, preparation
(formation of, in contact **glow discharge** electrolysis of water)

L63 ANSWER 13 OF 16 HCA COPYRIGHT 2006 ACS on STN
101:60956 Study of energetics and the mechanism of acoustic-chemical reactions. Relation of yields of hydrogen and hydrogen peroxide in different aqueous systems. Margulis, M. A.; Didenko, Yu. T. (Vses. Nauchno-Issled. Inst. Org. Sint., Moscow, USSR). Zhurnal Fizicheskoi Khimii, 58(6), 1402-5 (Russian) **1984.** CODEN: ZFKHA9. ISSN: 0044-4537.
AB The formation kinetics of H2 in sonolysis of H2O in O, N, and air was studied and the initial rates of H2O2 formation under the effect of ultrasound on H2O in H atm. was detd. By using the exptl. data, the O concn. in cavitational bubble in the final stage of compression was calcd. It represents a condensed **plasma** of strongly compressed gas, with a small **water vapor** impurity, in supercrit. state. A mechanism is proposed, which explains the change of basic H2O-sonolysis products yield in **N** + O **atm.** as function of O concn.
IT **7732-18-5**, reactions
(acoustic decompn. of, formation of hydrogen and hydrogen peroxide in, oxygen concn. in bubbles during)
RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **7782-44-7P**, preparation
(formation and concn. of, in bubbles, during sonolysis of water)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **1333-74-0P**, preparation
(formation of, in ultrasound decompn. of water, kinetics of)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 65
IT **7732-18-5**, reactions
(acoustic decompn. of, formation of hydrogen and hydrogen peroxide in, oxygen concn. in bubbles during)
IT **7782-44-7P**, preparation
(formation and concn. of, in bubbles, during sonolysis of water)
IT **1333-74-0P**, preparation 7722-84-1P, preparation
(formation of, in ultrasound decompn. of water, kinetics of)

L63 ANSWER 14 OF 16 HCA COPYRIGHT 2006 ACS on STN
96:71225 Thermal, electromagnetic system for producing hydrogen and oxygen. De Menezes, Maurilio (Brazil). Braz. Pedido PI BR 8001086 A **19810825**, 5 pp. (Portuguese). CODEN: BPXXDX. APPLICATION: BR 1980-1086 19800225.
AB H and O are produced by thermal dissocn. of water with laser radiation, electron **plasma**, **microwave** radiation, or other means, in an app. having porous ceramic walls, which facilitate dissocn. and help prevent recombination in the low pressure atm.
IT **7732-18-5**, reactions
(decompn. of, by laser radiation heating, app. for)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT 1333-74-0P, preparation 7782-44-7P, preparation
(manuf. of, by water thermal decompn., app. for)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC C01B003-02; C01B013-02
CC 49-1 (Industrial Inorganic Chemicals)
IT **7732-18-5**, reactions
(decompn. of, by laser radiation heating, app. for)
IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(manuf. of, by water thermal decompn., app. for)

L63 ANSWER 15 OF 16 HCA COPYRIGHT 2006 ACS on STN
95:177642 Solid polymer electrolyte water electrolysis. Takenaka, H.; Torikai, E.; Kawami, Y.; Wakabayashi, N. (Gov. Ind. Res. Inst., Ikeda, Japan). Advances in Hydrogen Energy, 2(Hydrogen Energy Prog., Vol. 1), 107-17 (English) **1981**. CODEN: AHENDB. ISSN: 0276-2412.

AB Electrocatalysts and their plating on solid polymer electrolytes (SPE) were studied. Perfluorosulfonic acid polymer **membranes** (Nafion) were used as SPE. Noble metals and their alloys were directly attached to both sides of the **membrane** without a binder by special metal plating methods. The methods utilizing reactions of metal salt soln. with reducing agent on the **membrane** surface made it possible to increase the adherence of electrocatalysts to the **membrane** and also to eliminate almost totally the resistance of the electrocatalyst/SPE interface. Pretreatments of the **membrane** were also studied to improve the adherence. Hydrothermal and gas **plasma** treatments were more effective. The constituents of cell voltage, i.e., anodic and cathodic overvoltages and ohmic drop, were measured for 5 noble metals and their alloys. The anodic overvoltage was a major constituent of voltage losses and clearly depended on the kinds of electrocatalysts. The anodic overvoltages increased in the following order: Ir < Rh < Rh/Pt < Pt < Pt/Ru < Pd. Pure Ru had

high initial activity; however, it was corroded during O evolution. The electrodes based on Ir alloys were the best electrocatalysts for O evolution and had a Tafel slope of 40-60 mV/decade. The effects of operating temp. on cell performance were also studied. The cathode and the anode were a thin layer of Pt and similar layer of Ir alloy, resp. The cell voltage decreased with an increase in temp. At c.d. 5 A/dm2 and at 90°, the cell voltage was 1.56-1.59 V corresponding to a thermal efficiency (based on ΔH) of 93-5%.

IT **7732-18-5**, reactions
(electrolysis of, in cell with Nafion **membrane** and noble metal electrocatalysts)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, preparation
(evolution of, in water electrolysis in cell with Nafion **membrane** and noble metal electrodes)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7782-44-7P**, preparation
(evolution of, in water electrolysis in electrolytic cell with Nafion **membrane** and noble metal electrocatalysts)

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 72-10 (Electrochemistry)
Section cross-reference(s): 49, 67

ST solid polymer electrolyte water electrolysis; noble metal electrocatalyst water electrolysis; Nafion **membrane** electrocatalyst water electrolysis; etching Nafion **membrane** water electrolysis; oxygen evolution water electrolysis cell

IT Platinum-group metal alloys, base
Platinum-group metals
(anodes, on Nafion **membrane** for oxygen evolution in water electrolysis)

IT **Plasma**, chemical and physical effects
(etching by, of Nafion **membrane** for oxygen evolution in

water electrolysis)
IT Iridium alloy, base
(anodes, on Nafion **membrane** for oxygen evolution in water electrolysis)
IT 7439-88-5, uses and miscellaneous 7440-05-3, uses and miscellaneous 7440-06-4, uses and miscellaneous 7440-16-6, uses and miscellaneous
(anodes, on Nafion **membrane** for oxygen evolution in water electrolysis)
IT 11107-71-4 12779-05-4 39349-40-1
(anodes, on Nafion **membrane** for oxygen evolution in water electrolysis)
IT **7732-18-5**, reactions
(electrolysis of, in cell with Nafion **membrane** and noble metal electrocatalysts)
IT **1333-74-0P**, preparation
(evolution of, in water electrolysis in cell with Nafion **membrane** and noble metal electrodes)
IT **7782-44-7P**, preparation
(evolution of, in water electrolysis in electrolytic cell with Nafion **membrane** and noble metal electrocatalysts)
IT 65506-90-3
(**membrane**, gas-**plasma** etching and hydrothermal treatment of, for electrocatalyst adherence in water electrolysis)

L63 ANSWER 16 OF 16 HCA COPYRIGHT 2006 ACS on STN
94:177482 Dissociation of water by **microwave plasma.**
(Akiyama, Morio, Japan; Tai, Kosuke; Inada, Takeshi). Jpn. Kokai Tokkyo Koho JP 56017902 **19810220** Showa, 2 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1979-93457 19790720.
AB **H2O** is **vaporized** dropwise in an air or inert gas stream and dissocd. at .apprx.2500° in a **microwave** discharge **plasma** at ≥915 MHz around an anode surrounded by a perforated and cooled catalyst metal, the paramagnetic O and nonmagnetic H being projected in different directions.
IT **7732-18-5**, reactions
(dissocn. of, in **microwave** discharge)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(manuf. of, by water dissocn. by **microwave** discharge)
RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC C01B003-04; C01B013-02; C25B005-00
CC 49-1 (Industrial Inorganic Chemicals)
ST water dissocn **microwave plasma**; oxygen manuf
water dissocn; hydrogen manuf water dissocn
IT **Microwave**, chemical and physical effects
(dissocn. by, of water for hydrogen and oxygen manuf.)
IT **7732-18-5**, reactions
(dissocn. of, in **microwave** discharge)
IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(manuf. of, by water dissocn. by **microwave** discharge)

=> D L64 1-22 CBIB ABS HITSTR HITIND

L64 ANSWER 1 OF 22 HCA COPYRIGHT 2006 ACS on STN
144:174310 Integrated **plasma** fuel cell process. Steinberg, Meyer (HCE, L.L.C., USA). U.S. Pat. Appl. Publ. US 2006024538 A1 20060202, 8 pp., Cont.-in-part of U.S. Ser. No. 604,153, abandoned. (English). CODEN: USXXCO. APPLICATION: US 2003-604961 20030828. PRIORITY: US 2003-2003/604153 20030627.
AB A method for efficiently producing energy, carbon, carbon monoxide, synthetic carbonaceous liq. and gaseous fuels and hydrogen from fossil or biomass fuels with minimal carbon dioxide emissions is disclosed.
IT **7782-44-7P**, Oxygen, preparation
(integrated **plasma** fuel cell process)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **1333-74-0P**, Hydrogen, uses
(integrated **plasma** fuel cell process)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

INCL 429017000; 429019000; 429021000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
ST **plasma** fuel cell process integrated
IT Hydrocarbons, uses
(C1-4; integrated **plasma** fuel cell process)
IT Thermodynamic cycle
(Rankine, **steam** boiler; integrated **plasma** fuel cell process)
IT **Water gas** shift reaction
(app.; integrated **plasma** fuel cell process)
IT Fischer-Tropsch reaction
(catalytic reactor; integrated **plasma** fuel cell process)
IT Fuel cells
(direct carbon; integrated **plasma** fuel cell process)
IT Ashes (residues)
Diesel fuel
Electrolytic cells
Plasma
(integrated **plasma** fuel cell process)
IT Gasoline
(integrated **plasma** fuel cell process)
IT Carbonaceous materials (technological products)
(integrated **plasma** fuel cell process)
IT Reactors
(**plasma**; integrated **plasma** fuel cell process)
IT Fuel cells
(solid oxide; integrated **plasma** fuel cell process)
IT **7782-44-7P**, Oxygen, preparation
(integrated **plasma** fuel cell process)
IT 67-56-1P, Methanol, uses 74-82-8P, Methane, uses 630-08-0P, Carbon monoxide, uses **1333-74-0P**, Hydrogen, uses 7440-44-0P, Carbon, uses 7704-34-9P, Sulfur, uses
(integrated **plasma** fuel cell process)

L64 ANSWER 2 OF 22 HCA COPYRIGHT 2006 ACS on STN
137:254703 Apparatus for producing electrical and heat energy, hydrogen, and oxygen. Kanarev, F. M.; Peisakhovich, Yu. A.; Podobedov, V. V. (Kubanskii Gosudarstvennyi Agrarnyi Universitet, Russia). Russ. RU 2177512 C1 **20011227**, No pp. given (Russian). CODEN: RUXXE7. APPLICATION: RU 2000-119666 20000724.
AB App. for producing elec. and heat energy, hydrogen, and oxygen is described. The app. case made of insulating material has bottom lug and bottom lid both constituting electrode-to-electrode chamber

divided by bottom cylindrical lug into anode and cathode spaces. Flat annular anode has holes and is placed in anode space of electrode-to-electrode chamber. Rod-type cathode made of high-melting material is placed in insulating rod which is driven by means of its outer thread into threaded hole of bottom lug and centered in outlet pipe hollow. Outlet pipe and case form near-cathode space. Cylinder-shaped wound device for building magnetic field is fitted onto bottom lid so that cathode and near-cathode space are under impact of its magnetic field. Electrodes designed to take off elec. current generated are mounted in cylindrical part of anode space. **Steam**-gas mixt. outlet pipe is arranged in case concentrically relative to cathode, oxygen outlet pipes are mounted in top part of anode space. The app. has enhanced power characteristics.

IT **1333-74-0P**, Hydrogen, processes **7782-44-7P**, Oxygen, processes
(app. for producing elec. and heat energy, hydrogen, and oxygen)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **7732-18-5**, Water, reactions
(electrolysis, high temp.; in app. for producing elec. and heat energy, hydrogen, and oxygen)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IC ICM C25B001-02
ICS C25B009-00

CC 72-9 (Electrochemistry)
Section cross-reference(s): 47, 76

IT Decomposition
(**plasma**; of water in app. for producing elec. and heat energy, hydrogen, and oxygen)

IT **1333-74-0P**, Hydrogen, processes **7782-44-7P**, Oxygen, processes
(app. for producing elec. and heat energy, hydrogen, and oxygen)

IT **7732-18-5**, Water, reactions
(electrolysis, high temp.; in app. for producing elec. and heat energy, hydrogen, and oxygen)

L64 ANSWER 3 OF 22 HCA COPYRIGHT 2006 ACS on STN
136:361000 Gear to generate thermal energy, hydrogen and oxygen. Kanarev, F. M.; Konarev, V. V.; Podobedov, V. V. (Kubanskii Gosudarstvennyi Agrarnyi Universitet, Russia). Russ. RU 2167958 C2 **20010527**, No pp. given (Russian). CODEN: RUXXE7. APPLICATION: RU 1999-111975 19990602.

AB App. to generate thermal energy, hydrogen and oxygen is disclosed. App. has frame with axial hole and cylindrical-conical boss and lower cover which form jointly with frame interelectrode chamber including intercommunicating anode and cathode spaces. Circular anode with hole is positioned in anode space and rod cathode in put into dielec. rod which is brought into interelectrode chamber through threaded hole in lower cover. It enables working part of cathode to be centered relative to hole in refractory metal bushing put through axial hole of frame. Diam. of hole in bushing is less than diam. of cathode. Branch pipe to feed working soln. is located in anode chamber, branch pipes to release oxygen are brought to upper part of anode space, branch pipes to release hydrogen are brought to upper part of cathode space and branch pipe to remove **steam** and gas mixt. is installed in axial hole of frame. Given gear makes it feasible to generate thermal energy by heating of soln. with the use of **plasma** and to produce simultaneously hydrogen and oxygen by way of electrolytic and thermal decompn. of water.

IT **1333-74-0P**, Hydrogen, processes **7782-44-7P**, Oxygen, processes
(app. for generating thermal energy, hydrogen and oxygen)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **7732-18-5**, Water, reactions
(electrolysis; app. for generating thermal energy, hydrogen and oxygen using)

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IC ICM C25B001-02
ICS C25B009-00
CC 72-9 (Electrochemistry)
Section cross-reference(s): 47, 76
ST app generation heat hydrogen oxygen water electrolysis **plasma** dissocn
IT Dissociation
(**plasma**; app. for generating thermal energy, hydrogen and oxygen using)
IT **1333-74-0P**, Hydrogen, processes **7782-44-7P**, Oxygen, processes
(app. for generating thermal energy, hydrogen and oxygen)
IT **7732-18-5**, Water, reactions
(electrolysis; app. for generating thermal energy, hydrogen and oxygen using)

L64 ANSWER 4 OF 22 HCA
136:360987 Electrochemical micro gap/micro-channel electrolysis. Schlueter, Claus (Germany). Ger. Offen. DE 10054157 A1 **20020508**, 6 pp. (German). CODEN: GWXXBX. APPLICATION: DE 2000-10054157 20001102.
AB Decompn. of water as hydrogen energy storage and renewable energy was used in underpotential electrochem. micro gap/micro-channel electrolytic cells operated using the electrochem. voltage gradient on selected metals. Electrochem. micro gap/micro-channel electrolysis under the underpotential using selected metals in the micro gap/micro-channel electrolytic liq. under high current led without creation of an external potential was used as renewable hydrogen prodn. system. Two-stage electrolytic/chem. procedure of the electrolytic decompn. from NaOH to Na and OH and chem. reaction of Na with water for NaOH with hydrogen evolution was used. The light-wt., wide-spread sheet metal foil and fine grid sandwich construction was employed in continuous economic manufg. with the increased efficiency using the electrolyzer. Waste heat cooling/exhaust gas were used in gas turbine cooling systems. H/OH or H/O high pressure gas injection **plasma** combustion chamber with high temp.-firm W or Ta glowing elements was employed.
IT **7732-18-5**, Water, reactions
(electrochem. micro gap/micro-channel electrolysis)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(electrochem. micro gap/micro-channel electrolysis)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM C25B001-00
CC 72-3 (Electrochemistry)
Section cross-reference(s): 49, 52
IT 1310-73-2, Sodium hydroxide, reactions **7732-18-5**, Water, reactions
(electrochem. micro gap/micro-channel electrolysis)
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(electrochem. micro gap/micro-channel electrolysis)

L64 ANSWER 5 OF 22 HCA COPYRIGHT 2006 ACS on STN
136:56365 Energy conversion process and device. Artamonov, A. S. (Sergeevich, Artamonov Aleksandr, Russia). Russ. RU 2154738 C2 **20000820**, No pp. given (Russian). CODEN: RUXXE7. APPLICATION: RU 1997-121735 19971209.
AB An elec.-conducting liq. undergoes electrothermal dissocn. with a liq. or solid hydrocarbon fuel introduced into a heating zone wherein the elec.-conducting liq. is injected. Heating and evapn. processes involve burst of injected sprays by periodic excitation of elec. discharges in them to produce a vapor-gas mixt. or H2+O2, or a mixt. of disintegration products of the solid fuel and liq. An app. implementing the process contains reactors with covers, mixing chambers, a **steam** collector, a **steam** turbine, an elec. generator, a rotary elec.-pulse generator, a transformer, a surface condenser with a condensate purifn. unit, and a chamber for prepg. an electrolyte and superheated water. The app. is also provided with burners arranged in the reactor covers, condensate injectors, addnl. reactors, and mixing chambers. Each burner has injectors with pipe connections incorporating cylindrical endless screw feeders and central electrodes in the form of cylindrical chambers connected to the nozzle and covered with an elec. insulator on outer surfaces. Another design version of the app. has an engine

contg. $\geq$1 cylinder with a piston, a crank gear coupled with a crankshaft, a combustion chamber, a transportation system for the soln. and fuel, an air supply system, a waste gas exhaust systems, and an elec. charge excitation system. The engine is provided with a composite injector with a pipe connection to the endless screw feeder, a central electrode, a fuel injector, and a water injector for the combustion chamber. Each engine cylinder is provided with addnl. combustion chambers and a fuel feed system. The crank gear consists of 2 parts braced together by means of a spring and an anchor bolt for their relative sliding.

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(formation in energy conversion process)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM F01K027-00
ICS F02B045-10; F01D015-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 47
IT **Plasma**
(in energy conversion process)
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(formation in energy conversion process)

L64 ANSWER 6 OF 22 HCA COPYRIGHT 2006 ACS on STN
135:155255 Water-fueled engines, method and system for power generation, and machine systems. Hatanaka, Takeshi (Japan). Jpn. Kokai Tokkyo Koho JP 2001221060 A2 **20010817**, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-67694 20000207.

AB The engine comprises (a) a means for feeding water equipped with a no-return valve, (b) a means for generation of hydrogen-oxygen **gas** from **water** by **plasma** arc treatment,
(d) a means for generation of high-temp. and -pressure **steam** by reaction of the gas, and (e) a means for generation of power from the **steam.** Also claimed are (A) method and a system for storage of the generated power as rotational energy, in flywheel turbines and (B) a machine system comprising the engines and

optionally a motor. The engines and the systems are environmentally friendly.

IT **1333-74-0P**, Hydrogen, uses **7782-44-7P**, Oxygen, uses
(engines operated by hydrogen-oxygen fuel generated by **plasma** treatment of water)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM F02C003-28
ICS B60K003-04; F01D001-04; F01D005-12; F02C006-00; B01J019-08; B60K006-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST environmentally friendly water fueled engine; motor **plasma** treated water fuel engine; hydrogen oxygen fuel environmentally friendly engine

IT Electric motors
Engines
Plasma
Seawater
Waters
(engines operated by hydrogen-oxygen fuel generated by **plasma** treatment of water)

IT Turbines
(flywheel; engines operated by hydrogen-oxygen fuel generated by **plasma** treatment of water)

IT Power
(generation; engines operated by hydrogen-oxygen fuel generated by **plasma** treatment of water)

IT **1333-74-0P**, Hydrogen, uses **7782-44-7P**, Oxygen, uses
(engines operated by hydrogen-oxygen fuel generated by **plasma** treatment of water)

IT 7722-84-1P, Hydrogen peroxide, uses
(water contg.; engines operated by hydrogen-oxygen fuel generated by **plasma** treatment of water)

L64 ANSWER 7 OF 22 HCA

135:155249 Closed-cycle hydrogen engines, system and method for power

generation, and machine systems. Hatanaka, Takeshi (Japan). Jpn. Kokai Tokkyo Koho JP 2001221013 A2 **20010817**, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-67695 20000207.

AB The closed-cycle hydrogen engine comprises (a) an expansion turbine, (b) a high-pressure pump for pressurization of electrolyte solns., (c) a means for generation of mixt. gas of hydrogen-oxygen and **steam** from electrolyte soln. by **plasma** arc treatment, (d) a means for combustion of the mixt. gas for generation of high-temp. and -pressure **steam**, (e) a jet nozzle for feeding the high-temp. and -pressure **steam** to the turbine, (f) a condenser for generation of electrolyte soln. from the turbine waste gas, and (g) a circulation cycle connecting the condenser and the pump. Also claimed are (A) the above stated engines placed in an engine housing, (B) method for power generation with the engine, (C) a system for the power generation, and (D) a machine system comprising the engines and optionally a motor. The engines and the systems are environmentally friendly.

IT **1333-74-0P**, Hydrogen, uses **7782-44-7P**, Oxygen, uses
(fuel; closed-cycle hydrogen engines operated by fuel generated from electrolyte solns. in **plasma** reactors)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM F01K025-00
ICS B60K006-02; C01B003-02; C01B003-04; F01D005-02; F01D009-02; F01K015-02; F02C003-22

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST environmentally friendly closed system hydrogen engine; oxygen hydrogen fuel environmentally friendly engine; motor closed system hydrogen engine; electrolyte circulation closed system turbine engine; **plasma** arc electrolyte conversion fuel engine

IT Inks
(India; closed-cycle hydrogen engines operated by fuel generated from electrolyte solns. in **plasma** reactors)

IT Condensers
Electric motors
Electrolytes
Engines

Plasma
Seawater
Turbines
Waters
(closed-cycle hydrogen engines operated by fuel generated from electrolyte solns. in **plasma** reactors)

IT Power
(generation; closed-cycle hydrogen engines operated by fuel generated from electrolyte solns. in **plasma** reactors)

IT 7722-84-1P, Hydrogen peroxide, uses
(electrolyte; closed-cycle hydrogen engines operated by fuel generated from electrolyte solns. in **plasma** reactors)

IT **1333-74-0P**, Hydrogen, uses **7782-44-7P**, Oxygen, uses
(fuel; closed-cycle hydrogen engines operated by fuel generated from electrolyte solns. in **plasma** reactors)

L64 ANSWER 8 OF 22 HCA COPYRIGHT 2006 ACS on STN

134:165236 Method and apparatus for manufacture of hydrogen, and power system using same.. Hatanaka, Takeshi (Japan). Jpn. Kokai Tokkyo Koho JP 2001039701 A2 **20010213**, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-243651 19990728.

AB The method comprises arranging multiphase a.c. electrodes in a casing for forming plural reaction zones along those electrodes, supplying multiphase a.c. power to the multiphase a.c. electrodes for generating **plasma** arcs in the plural reaction zones in order, supplying water to the reaction zones to generate **steam**, and catalytically reacting that in the **plasma** arcs of the reaction zones in order to obtain H2 and O2. The app. includes micro-reaction-path means packed in the reaction zones, and a neutral electrode arranged opposite to the multiphase a.c. electrodes in the casing; the neutral electrode is connected to the neutral point of the multiphase a.c. power. The power system includes a water supply source, a H2 manuf. app. for generating a H2- and O2-contg. fuel by decompn. of water, a prime mover driven by combustion of the fuel to generate mech. output, and a power source driven by the prime mover.

IT **7732-18-5**, Water, reactions
(decompn. of; method and app. for manuf. of hydrogen and power system using same)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, preparation
(fuel contg.; method and app. for manuf. of hydrogen and power

system using same)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7782-44-7P**, Oxygen, preparation
(method and app. for manuf. of hydrogen and power system using same)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM C01B003-04
ICS F22B001-30
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 52
ST hydrogen manuf app **plasma** water decompn; power system hydrogen manuf app
IT **Plasma**
(method and app. for manuf. of hydrogen and power system using same)
IT **7732-18-5**, Water, reactions
(decompn. of; method and app. for manuf. of hydrogen and power system using same)
IT **1333-74-0P**, Hydrogen, preparation
(fuel contg.; method and app. for manuf. of hydrogen and power system using same)
IT **7782-44-7P**, Oxygen, preparation
(method and app. for manuf. of hydrogen and power system using same)

L64 ANSWER 9 OF 22 HCA COPYRIGHT 2006 ACS on STN
128:129590 **Plasma** burner for reactive decomposition of gas streams. Preuschen, Erwin G. (Preuschen, Erwin G., Germany). Ger. Offen. DE 19628932 A1 **19980129**, 6 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1996-19628932 19960718.
AB A **plasma** burner is described for sep. of a **water vapor** stream into H2 and O2. The **water vapor** stream is injected through a lance in the anode bore of the burner comprising a coaxial cathode/anode unit. The burner can be heated by a nuclear reactor. The housing downstream of the burner contains devices for generating an electrostatic field at the discharge openings which also contain mol. grids from Pt or Pt alloys or Pt-coated porous ceramics. The sepd. H2 can be

recirculated to the **plasma** burner.

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(**plasma** burner for sepg. **water vapor** streams into hydrogen and oxygen)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **7732-18-5**, Water, reactions
(**plasma** burner for sepg. **water vapor** streams into hydrogen and oxygen)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IC ICM B01D057-00
ICS B01D053-00; C01B003-50

CC 47-3 (Apparatus and Plant Equipment)

ST **plasma** burner water sepn hydrogen oxygen

IT Anodes
Burners
Cathodes
Electrostatic field
Lances
Thermal decomposition
(**plasma** burner for sepg. **water vapor** streams into hydrogen and oxygen)

IT Platinum alloy
(**plasma** burner for sepg. **water vapor** streams into hydrogen and oxygen)

IT 7440-06-4, Platinum, uses
(**plasma** burner for sepg. **water vapor** streams into hydrogen and oxygen)

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(**plasma** burner for sepg. **water vapor** streams into hydrogen and oxygen)

IT **7732-18-5**, Water, reactions
(**plasma** burner for sepg. **water vapor** streams into hydrogen and oxygen)

L64 ANSWER 10 OF 22 HCA COPYRIGHT 2006 ACS on STN
125:343576 **Plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber. Yamazaki, Shunpei (Handotai Energy Kenkyusho, Japan). Jpn. Kokai Tokkyo Koho JP 08241869 A2 **19960917** Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-61890 19960223.
AB Impurity in a **plasma** reaction chamber, used for forming a film, is removed by converting H and HCl or Cl to **plasma.** The method removes an impurity such as O and alkali metals from inner wall of the chamber which is used for manuf. of a p-type or n-type semiconductor layer and a photoconductor.
IT **1333-74-0P**, Hydrogen, processes **7782-44-7P**, Oxygen, processes
(removal; in **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM H01L021-205
ICS C23C016-50; C23F004-00; H01L021-3065
ICA C23C014-00
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76
ST semiconductor manuf **plasma** CVD chamber cleaning; photoconductor manuf **plasma** CVD chamber cleaning
IT **Plasma**
(formation; **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
IT Semiconductor devices
(manuf.; **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
IT Electric conductors
(photoconductive; **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)

IT **Water vapor**
(removal; in **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
IT Alkali metals, processes
(removal; in **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
IT Vapor deposition processes
(**plasma**, **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
IT 993-07-7, Trimethylsilane 7803-62-5, Silane, reactions
(**plasma** CVD film raw material; in **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
IT 16887-00-6P, Chlorine ion, preparation
(**plasma** formation from; **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
IT 7647-01-0, Hydrogen chloride, processes
(**plasma** formation from; **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
IT 12586-59-3P, Proton
(**plasma**; **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)
IT **1333-74-0P**, Hydrogen, processes **7782-44-7P**, Oxygen, processes
(removal; in **plasma** treatment for removal of impurity attached on inner wall of **plasma** reaction chamber)

L64 ANSWER 11 OF 22 HCA COPYRIGHT 2006 ACS on STN
123:269320 Vacuum **plasma** spraying of high-performance electrodes for alkaline water electrolysis. Schiller, G.; Henne, R.; Borck, V. (Institute of Technical Thermodynamics, Deutsche Forschungsanstalt Luft- und Raumfahrt, Stuttgart, 70569, Germany). Journal of Thermal Spray Technology, 4(2), 185-94 (English) **1995.** CODEN: JTTEE5. ISSN: 1059-9630.
AB Electrode coatings for advanced alk. water electrolysis were produced by applying the vacuum **plasma** spraying (VPS) process. The characteristics of the used VPS equipment that were essential for the development of effective electrocatalytic electrode layers are presented. Mo-contg. Raney Ni coatings were applied for cathodic H2 evolution, and Raney Ni/Co3O4 matrix composite layers were developed for the anodic O2 evolution reaction. For the prepn. of Raney Ni coatings, a precursor alloy such as Ni-Al was sprayed that had to be leached subsequently in caustic soln. to remove the Al content, forming a porous,

high-surface-area Ni layer. The spray powders and the resulting VPS layers were studied by metallog., x-ray diffraction (XRD), and SEM/energy dispersive anal. by x-ray(EDX). For spraying of thermally sensitive oxide electrocatalysts (e.g., Co_3O_4), special process conditions involving **plasma**-chem. effects (reactive **plasma** spraying) had to be developed. The electrocatalytic activity of the electrode coatings was investigated by performing polarization curves free of ohmic losses (IR-free) and long-term tests under conditions of continuous and intermittent operation, which showed excellent electrochem. properties.

IT **1333-74-0P**, Hydrogen, preparation
(evolution of hydrogen in alk. water electrolysis using nickel electrodes)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7782-44-7P**, Oxygen, preparation
(evolution of oxygen in alk. water electrolysis using nickel electrodes)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **7732-18-5**, Water, reactions
(vacuum **plasma** spraying of nickel on high-performance electrodes for alk. water electrolysis)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 72-9 (Electrochemistry)
Section cross-reference(s): 52, 56
ST vacuum **plasma spraying** electrode **water** electrolysis; alk water electrolysis high performance electrode
IT Electrolytic polarization
(polarization of vacuum **plasma** sprayed Raney nickel electrodes in alk. water electrolysis)
IT Electrodes
(vacuum **plasma** spraying of high-performance electrodes for alk. water electrolysis)
IT Spraying

(vacuum **plasma** spraying of nickel and nickel alloy electrodes for hydrogen and oxygen manuf. from alk. water electrolysis)

IT 164850-48-0
(Al-Mo-Ni alloy precursor for producing vacuum **plasma** sprayed Raney nickel electrodes in alk. water electrolysis)

IT **1333-74-0P**, Hydrogen, preparation
(evolution of hydrogen in alk. water electrolysis using nickel electrodes)

IT **7782-44-7P**, Oxygen, preparation
(evolution of oxygen in alk. water electrolysis using nickel electrodes)

IT 7439-98-7, Molybdenum, uses
(vacuum **plasma** spraying of nickel and nickel alloys with molybdenum for hydrogen and oxygen evolution from electrolysis of alk. water)

IT 7440-02-0, Nickel, uses
(vacuum **plasma** spraying of nickel on high-performance electrodes for alk. water electrolysis)

IT 1310-58-3, Potassium hydroxide, uses
(vacuum **plasma** spraying of nickel on high-performance electrodes for alk. water electrolysis)

IT **7732-18-5**, Water, reactions
(vacuum **plasma** spraying of nickel on high-performance electrodes for alk. water electrolysis)

L64 ANSWER 12 OF 22 HCA COPYRIGHT 2006 ACS on STN

122:121076 **Plasma** ashing apparatus. Sasaki, Takashi; Harada, Michuki; Hitomi, Shuji; Yoneyama, Shimao (Shinko Pantec Co Ltd, Japan; Mitsubishi Corp; Japan Storage Battery Co Ltd; Emu Shii Erekutoronikusu Kk). Jpn. Kokai Tokkyo Koho JP 06151386 A2 **19940531** Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1992-295058 19921104.

AB In manuf. of **plasma** ashing app. comprising H2 and O2 gas sources and a **plasma** asher for removing resist used in semiconductor product processes by **plasma** generated in an ashing chamber using O2 gas, mixt. of O2 gas and H2 **gas** or **water vapor** formed by mixing O2 gas and H2 gas from the gas sources, the gas source is a water electrolysis device.

IT **1333-74-0P**, Hydrogen, uses **7782-44-7P**, Oxygen, uses
(manuf. of **plasma** ashing app.)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **7732-18-5**, Water, uses
(manuf. of **plasma** ashing app.)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IC ICM H01L021-302
ICS H01L021-027
CC 76-14 (Electric Phenomena)
ST **plasma** ashing app water electrolysis device; oxygen hydrogen water electrolysis device
IT Resists
(manuf. of **plasma** ashing app. for removing of)
IT Ashing
(**plasma**, manuf. of **plasma** ashing app.)
IT **1333-74-0P**, Hydrogen, uses **7782-44-7P**, Oxygen, uses
(manuf. of **plasma** ashing app.)
IT **7732-18-5**, Water, uses
(manuf. of **plasma** ashing app.)

L64 ANSWER 13 OF 22 HCA COPYRIGHT 2006 ACS on STN
117:57606 Vacuum **plasma** sprayed electrodes for advanced alkaline water electrolysis. Schiller, G.; Borck, V. (Inst. Tech. Thermodyn., Ger. Aerosp. Res. Estab., Stuttgart, 7000/80, Germany). International Journal of Hydrogen Energy, 17(4), 261-73 (English) **1992.** CODEN: IJHEDX. ISSN: 0360-3199.
AB Electrode coatings for advanced alk. water electrolysis were produced by applying vacuum **plasma** spraying (VPS). The characteristics of the VPS-equipment used which are essential for developing effective electrocatalytic electrode layers are presented. Raney nickel and Raney nickel/Mo coatings were applied for cathodic hydrogen evolution whereas Co_3O_4 spinel and Raney nickel/Co_3O_4 composite layers served as electrocatalytic coatings for anodic oxygen evolution. The spray powders and the VPS layers were studied by x-ray diffraction and high resoln. SEM. Careful surface prepn. of the substrates is required to achieve well-bonded and stable layers esp. with NiAl precursor alloy which has to be activated subsequently to Raney nickel. Due to the fact that oxide electrocatalysts such as Co_3O_4, for example, exhibit a high tendency

for oxygen loss and decompn. and, thus, loss of electrocatalytic activity at elevated temps. special process conditions and parameters had to be developed. "Reactive **plasma** spraying" involving plasmachem. effects allows the processing of thermal sensitive oxides to stable and undecomposed layers. The electrocatalytic activity of the electrode coatings was investigated by performing IR-free polarization curves up to current densities of 1 A cm-1 and long-time tests under continuous current loading of 0.5 A cm-2 over a period of 3000 h. The cathodic layers were found to exhibit overvoltages of 70-90 mV at A cm-2 and 70° in 25% KOH soln. Raney nickel/Co3O4 composite anodes, which are still in the initial state of development, show overvoltage values of 290 mV at 1 A cm-2.

IT **7732-18-5**, Water, reactions
(electrolysis of alk., vacuum **plasma** spray electrode for)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **7782-44-7P**, Oxygen, preparation
(evolution of, anodic, Raney nickel/cobalt oxide composite layers as electrocatalytic coating for)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **1333-74-0P**, Hydrogen, preparation
(evolution of, on different Raney nickel coating, compared with uncoated nickel)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

CC 72-2 (Electrochemistry)
Section cross-reference(s): 49, 56
ST vacuum **plasma sprayed** electrode **water** electrolysis; Raney nickel molybdenum coated electrode; cobalt oxide Raney nickel composite electrode
IT Surface structure
(of Raney nickel **plasma**-sprayed coatings, for cathodes)
IT **7732-18-5**, Water, reactions

(electrolysis of alk., vacuum **plasma** spray electrode for)
IT **7782-44-7P**, Oxygen, preparation
(evolution of, anodic, Raney nickel/cobalt oxide composite layers as electrocatalytic coating for)
IT **1333-74-0P**, Hydrogen, preparation
(evolution of, on different Raney nickel coating, compared with uncoated nickel)
IT 1310-58-3, Potassium hydroxide, properties
(polarization of different vacuum **plasma** sprayed Raney nickel cathode in soln. contg., comparison with uncoated nickel)
IT 12004-71-6 12043-39-9 12635-27-7
(vacuum **plasma** spraying of, activated subsequently to Raney nickel, for alk. water electrolysis)

L64 ANSWER 14 OF 22 HCA COPYRIGHT 2006 ACS on STN
116:160736 Water radiolysis under NET conditions. Lorenzetto, P.; Bjergbakke, E.; Hickel, B. (NET Team, IPP, Garching, D-8046, Germany). Fusion Engineering and Design, 17, 265-70 (English) **1991.** CODEN: FEDEEE. ISSN: 0920-3796.
AB Radiolytic decompn. of the NET **plasma** facing component and blanket water coolant is expected due to the intense radiation fields present inside the vacuum vessel. A sensitivity anal. was performed by computer simulation to study the formation and the suppression of the radiolytic products under NET conditions. The formation of the stable radiolytic products (oxygen, hydrogen and hydrogen peroxide) formed within the water due to the decompn. induced by mixed neutron and gamma irradn. is given for several cases, which are relevant to the first wall water coolant. The influence of coolant temp. (20, 70, 130, and 200°C), heterogeneous decompn. of H2O2, added solutes such as hydrogen, and ferrous ions simulating possible corrosion products was studied. There are still large discrepancies in the literature on the radiation chem. yields (G-values) in the case of the neutron irradn. Therefore 3 sets of G-values were considered, and the sensitivity of the applied G-values for mixed neutron and gamma irradn. was investigated. For all these cases, the hydrogen concn. required to suppress the water radiolysis is given, and some crit. issues with respect to the specific contribution of neutrons with high energy typical for the fusion spectrum (10-14 MeV) on the radiolytic water decompn. are discussed.
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**, Oxygen, preparation
(formation of, in radiolysis of water under tokamak conditions)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **7732-18-5**, Water, reactions
(radiolysis of, under tokamak conditions, hydrogen suppression of)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 71-2 (Nuclear Technology)
Section cross-reference(s): 74
IT Nuclear fusion reactors, tokamak
(**plasma**-facing component of, radiolytic decompn. of coolant water in)
IT **1333-74-0P**, Hydrogen, preparation 7722-84-1P, Hydrogen peroxide, preparation **7782-44-7P**, Oxygen, preparation
(formation of, in radiolysis of water under tokamak conditions)
IT **7732-18-5**, Water, reactions
(radiolysis of, under tokamak conditions, hydrogen suppression of)

L64 ANSWER 15 OF 22 HCA COPYRIGHT 2006 ACS on STN
106:164339 Electrocatalysts for advanced electrolysis of water.
Schurnberger, W.; Divisek, J. (Stuttgart, Fed. Rep. Ger.).
VDI-Berichte, 602, 63-78 (German) **1987.** CODEN: VDIBAP.
ISSN: 0083-5560.
AB A review with 19 refs. The important catalysts for the prodn. of H and O are discussed. Among these are Raney Ni, spinels, perovskites and porous sintered Ni (or Ni alloys). The possibility of coating electrodes via **plasma** spraying is also considered.
IT **7732-18-5**, Water, reactions
(electrolysis of, catalysts for)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**,
Oxygen, preparation
(prodn. of, in water electrolysis, catalysts for)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 72-0 (Electrochemistry)
Section cross-reference(s): 67
IT **7732-18-5**, Water, reactions
(electrolysis of, catalysts for)
IT **1333-74-0P**, Hydrogen, preparation **7782-44-7P**,
Oxygen, preparation
(prodn. of, in water electrolysis, catalysts for)

L64 ANSWER 16 OF 22 HCA COPYRIGHT 2006 ACS on STN
101:237292 Low pressure **plasma** sprayed electrode coatings for alkaline water electrolysis. Schnurnberger, W.; Henne, R.; Von Bradke, M. (Inst. Tech. Phys., DFVLR, Stuttgart, 7000/80, Fed. Rep. Ger.). Advances in Hydrogen Energy, 4(Hydrogen Energy Prog. 5, Vol. 2), 933-41 (English) **1984.** CODEN: AHENDB. ISSN: 0276-2412.

AB Electrodes coated with stable and active electrocatalysts allow H prodn. in alk. solns. at high c.d. and efficiency. Porous Raney Ni and mixed metal oxides (spinels, perovskites) used as electrode coatings reduce significantly the overvoltage of H_2O decompn. By means of the low pressure **plasma** spraying method (LPPS), various electrocatalytic materials can be applied reliably without undue overheating of the substrates. Furthermore, in consequence of the short time needed for the LPPS coating process, thermal decompn. and structural changes of the catalysts can be largely avoided. The prepn. and properties of Raney Ni and Ni/Co-spinel coatings on Ni substrates are reported. The structure of the electrode coatings was studied by SEM and x-ray diffraction, indicating no significant change of the electrocatalysts subsequent to LPPS. The electrochem. behavior of the coatings was investigated with regard to evolution of both O and H in 25 wt. % KOH solns. at c.d. $\leq$1 A/cm2. Tafel-plots at 23°-100° are given. The LPPS coating technique can be used to activate both anodes and cathodes for electrolysis of alk. H_2O.

IT **7732-18-5**, reactions
(electrolysis of, **plasma**-sprayed electrodes for)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(prodn. of, by **water** electrolysis, **plasma-sprayed** electrodes for)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 72-9 (Electrochemistry)
ST **plasma sprayed** electrode **water** electrolysis; nickel Raney cobalt spinel electrode; hydrogen oxygen electroprodn water electrolysis
IT Electrodes
(**plasma-sprayed**, for **water** electrolysis)
IT Coating process
(**plasma**, on electrodes for water electrolysis)
IT 12017-35-5
(electrodes with coatings from **plasma-sprayed**, for **water** electrolysis)
IT 7440-02-0, uses and miscellaneous
(electrodes, **plasma-sprayed**, for **water** electrolysis)
IT **7732-18-5**, reactions
(electrolysis of, **plasma**-sprayed electrodes for)
IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(prodn. of, by **water** electrolysis, **plasma-sprayed** electrodes for)

L64 ANSWER 17 OF 22 HCA COPYRIGHT 2006 ACS on STN
100:182188 Developments in advanced alkaline water electrolysis. Bowen, C. T.; Davis, H. J.; Henshaw, B. F.; Lachance, R.; LeRoy, R. L.; Renaud, R. (Noranda Res. Cent., Pointe-Claire, QC, H9R 1G5, Can.).

International Journal of Hydrogen Energy, 9(1-2), 59-66 (English) **1984.** CODEN: IJHEDX. ISSN: 0360-3199.

AB Two parallel alk. water electrolysis programs are underway at the Noranda Research Center. One of these is part of Canada's contribution to the International Energy Agency (IEA) H program. Its objective is the evaluation of new anode, cathode and separator materials on an industrial scale. Porous Teflon cloth impregnated with K titanate was shown to have the lowest resistance factor of the separators tested, but its fragility and hydrophobicity are of concern. Felted polysulfone has the strength, gas tightness and low resistivity required. For all separators, effective resistivity depended on the free space allowed, the strength of this effect increasing with separator hydrophobicity. Ni electrodes, **plasma**-sprayed with Ni/Al or Ni/stainless steel powders, gave electrocatalytic activities with high stability. The 2nd program, development of Electrolyzer Inc.'s advanced unipolar electrolysis technol., has benefited from the IEA activity. Results obtained with 3 100-kA cells on the Generation I design after more than 1000 h of operation are presented, together with results obtained in theGeneration II configuration over a 5000 h period.

IT **7732-18-5P**, preparation
(electrolysis of alk., cells for)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(prodn. of, in alk. water electrolysis, cells for)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 72-9 (Electrochemistry)
Section cross-reference(s): 52

IT **7732-18-5P**, preparation
(electrolysis of alk., cells for)

IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(prodn. of, in alk. water electrolysis, cells for)

L64 ANSWER 18 OF 22 HCA COPYRIGHT 2006 ACS on STN

97:225561 Anodic and cathodic catalysts for high-temperature high current density alkaline water electrolysis. Prigent, M.; Nenner, T. (Tech. Appl. Energet., Inst. Francais Petrole, Rueil Malmaison, 92506, Fr.). Advances in Hydrogen Energy, 3(Hydrogen Energy Prog. 4, Vol. 1), 299-307 (English) **1982.** CODEN: AHENDB. ISSN: 0276-2412.

AB Electrocatalysts for electrolysis of alk. H2O at a c.d. of 10 kA/m2 and a temp. of 160° are prepd. on a Raney Ni base prepd. by **plasma** gun spraying of a Ni-Al alloy on a Ni grid, followed by KOH leaching. X rays studies show that resistance to sintering at elevated temp. of the finely divided layer of Ni is improved by incorporating small quantities of a 3rd element like Ti, Zr, Mo. Evaluation of the catalyst is performed at 10 kA/m2, in 40% wt. KOH at 160°, the electrodes being pressed against the diaphragm. These electrodes used as cathode will give a voltage redn. of .apprx.210 mV compared to the non-activated electrode. These Raney electrodes covered with mixed oxide of Co, Sr, La give a stable redn. of the O overvoltage of 180 mV at 160°. When used in a couple, a total cell voltage of 1.75 V can be obtained at 160°.

IT **7732-18-5**, reactions
(electrolysis of alk., Raney nickel catalytic electrodes for)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(manuf. of, by electrolysis of alk. water, Raney nickel catalysts for)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 72-9 (Electrochemistry)
Section cross-reference(s): 49, 52, 67

IT **7732-18-5**, reactions

(electrolysis of alk., Raney nickel catalytic electrodes for)

IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(manuf. of, by electrolysis of alk. water, Raney nickel catalysts for)

L64 ANSWER 19 OF 22 HCA COPYRIGHT 2006 ACS on STN

91:65203 Electrolytic production of hydrogen from alkaline solutions - active electrodes for potassium hydroxide electrolysis. Nidola, A.; Spaziante, P. M.; Giuffre, L. (Oronzio De Nora Impianti Elettrochim. S.p.A., Milan, Italy). Comm. Eur. Communities, [Rep.] EUR, EUR 6085, Semin. Hydrogen Energy Vector: Prod., Use, Transp., 212-28 (English) **1978.** CODEN: CECED9.

AB New electrocatalysts for H and O evolution electrode reactions in KOH 29 wt. % electrolysis at atm. pressure and at 70° were studied and developed by Oronzio De Nora-Impianti Elettrochimici S.p.A.. Cathodic catalysts include Ru and Re deposited on Fe electrode bases via electrolytic or **plasma** jet techniques, while anodic catalysts include steel activated Ni and/or Co on Ni coated Fe or Ni electrode bases via the **plasma** jet route. The coatings with respect to com. catalysts, which include Ni and/or Fe sulfide, have the following practical advantages: low overvoltage for the desired reaction even at high c.d. (10 kA/m2), absence of catalytic aging phenomena vs. operation time and c.d., and no asbestos diaphragm deterioration. The relatively low amt. of catalysts (≤50 g/m2 for anodic coatings, ≤20 g/m2 for cathodic coatings) deposited on electrode bases makes them attractive for H prodn. by electrolysis of KOH solns. provided that a c. d. at least ≥3.0 kA/m2 is used.

IT **7732-18-5**, reactions
(electrolysis of, dissocn. catalysts in)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(manuf. of, by electrolysis of water, catalysts in)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 72-10 (Electrochemistry)
Section cross-reference(s): 49, 67
IT **7732-18-5**, reactions
(electrolysis of, dissocn. catalysts in)
IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(manuf. of, by electrolysis of water, catalysts in)

L64 ANSWER 20 OF 22 HCA COPYRIGHT 2006 ACS on STN
91:11326 Electrochemical reduction of **water vapor.**
Developmental stage of an assembly of planar cells. Viguie, J. C.
(Cent. Etud. Nucl. Grenoble, Commis. Energ. At., Grenoble, Fr.).
Comm. Eur. Communities, [Rep.] EUR, EUR 6085, Semin. Hydrogen Energy
Vector: Prod., Use, Transp., 310-27 (French) **1978.** CODEN:
CECED9.
AB The operating conditions of a planar electrolytic cell are described. The 50-cm2 half-cathodic cell was fabricated with a solid electrolyte of ZrO2-9 mol % Y2O3, assocd. with an embedded layer of Ni powder as the cathode. The disk is supported by a honeycomb-shaped ceramic covered by a layer of Ni. The solid electrolyte can be prepd. by powder compaction and sintering or by **plasma** jet projection.
IT **7732-18-5**, vapor
(electrochem. redn. of, in planar cell)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(manuf. of, by electrolysis of **water vapor** in
planar cell)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 72-10 (Electrochemistry)
Section cross-reference(s): 49, 61
ST electrochem redn **water vapor** cell; planar cell **water vapor** electroredn; electrolytic cell **water vapor** redn; hydrogen oxygen **water vapor** redn; oxygen hydrogen **water vapor** redn
IT Reduction, electrochemical
(of **water vapor** in planar cells)
IT Electrolytic cells
(planar, for **water vapor** redn.)
IT 7440-02-0, uses and miscellaneous
(cathodes, for **water vapor** electroredn. in planar cell)
IT **7732-18-5**, vapor
(electrochem. redn. of, in planar cell)
IT 1314-23-4, uses and miscellaneous
(electrolyte, stabilized with yttrium oxide, for **water vapor** electroredn. in planar cells)
IT 11149-64-7
(in planar cells for **water vapor** electrochem. redn.)
IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(manuf. of, by electrolysis of **water vapor** in planar cell)
IT 1314-36-9, uses and miscellaneous
(zirconia electrolyte stabilized with, for **water vapor** electroredn. in planar cells)

L64 ANSWER 21 OF 22 HCA COPYRIGHT 2006 ACS on STN
90:46055 Electrolytic gas generator for producing a hydrogen-oxygen flame. Inoue, Kiyoshi (Inoue-Japax Research Inc., Japan). Jpn. Kokai Tokkyo Koho JP 53110989 **19780928** Showa, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1977-26319 19770310.
AB An improved electrolytic gas generator for the H-O torch (used for example in a **plasma** welder) employs a pulsed d.c. in the electrolysis. By using a pulsed d.c., the quantity of gas produced is increased and the mixing of **water vapor** with the gas involved is minimized.
IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(electroprodn. of, for hydrogen-oxygen welding)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC C25B001-04
CC 72-12 (Electrochemistry)
ST hydrogen oxygen electroprodn welding torch; **plasma** welding
hydrogen oxygen electroprodn
IT Torches
Welding
(**plasma**, electroprodn. of hydrogen and oxygen for)
IT **1333-74-0P**, preparation **7782-44-7P**, preparation
(electroprodn. of, for hydrogen-oxygen welding)

L64 ANSWER 22 OF 22 HCA COPYRIGHT 2006 ACS on STN
88:165772 Chemical model for the synthesis of living matter precursors.
Simionescu, C. I.; Dumitriu, S.; Popa, V. I.; Bulacovschi, V.;
Simionescu, B. (Inst. Polytech., Iasi, Rom.). Revue Roumaine de
Chimie, 23(1), 89-102 (French) **1978.** CODEN: RRCHAX.
ISSN: 0035-3930.
AB A chem. model was established for the synthesis of precursors of
living matter taking into account the compn. of the primeval atm.,
the energy sources, and the catalysts. The decompn. of CH4/H2O,
CH4/NH3, and CH4/NH3/H2O mixts. in high-frequency **plasma**
led to the formation of aldehydes, alcs., acids, ketones, amines,
and nitriles, intermediates in the synthesis of biomonomers. The
influences of different parameters, catalysts, pH, and energy
sources were studied.
IT **7732-18-5**, reactions
(decompn. of, in primordial atm.)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, biological studies **7782-44-7P**,
biological studies
(formation of, in primordial atm.)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 6-13 (General Biochemistry)
IT 74-82-8, reactions 7664-41-7, reactions **7732-18-5**, reactions
(decompn. of, in primordial atm.)
IT 50-00-0P, biological studies 64-17-5P, biological studies 64-18-6P, biological studies 64-19-7P, biological studies 67-56-1P, biological studies 67-63-0P, biological studies 67-64-1P, biological studies 74-85-1P, biological studies 74-86-2P, biological studies 74-89-5P, biological studies 74-90-8P, biological studies 74-98-6P, biological studies 75-05-8P, biological studies 75-07-0P, biological studies 75-65-0P, biological studies 78-92-2P 78-93-3P, biological studies 106-97-8P, biological studies 106-99-0P, biological studies 107-13-1P, biological studies 115-11-7P, biological studies 124-38-9P, biological studies 124-40-3P, biological studies 590-18-1P 624-64-6P 630-08-0P, biological studies **1333-74-0P**, biological studies **7782-44-7P**, biological studies
(formation of, in primordial atm.)

=> D L65 1-19 CBIB ABS HITSTR HITIND

L65 ANSWER 1 OF 19 HCA COPYRIGHT 2006 ACS on STN
142:25868 Method to manufacture composite polymer electrolyte **membranes** coated with inorganic thin films for fuel cells. Ha, Heung-Yong; Kwak, Soon Jong; Kim, Daejin; Shim, Juno; Oh, In-Hwan; Hong, Seong-Ahn; Lim, Tae-Hoon; Nam, Suk-Woo (Korea Institute of Science and Technology, S. Korea). U.S. Pat. Appl. Publ. US 2004241520 A1 20041202, 9 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-751138 20031230. PRIORITY: KR 2003-35127 20030531.
AB The present invention relates to a method for manufg. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells using a **plasma** enhanced CVD (PECVD) method or a reactive sputtering method, so as to reduce the crossover of methanol through polymer electrolyte **membranes** for fuel cells and enhance the performance of the fuel cells. The manufg. method of composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells according to the present invention is characterized to obtain composite **membranes** by coating the surface of com. composite polymer electrolyte **membranes** for fuel cells with inorg. thin films using a PECVD method or a reactive sputtering method. The

inorg. materials to form the inorg. thin films are chosen one or more from the group comprising silicon oxide (SiO2), titanium oxide (TiO2), zirconium oxide (ZrO2), zirconium phosphate (Zr(HPO4)2), zeolite, silicalite, and aluminum oxide (Al2O3). The present invention, by coating the polymer electrolyte **membranes** for fuel cells with inorg. thin films via a PECVD method or a reactive sputtering method, reduces the methanol crossover sizably without seriously reducing the ionic cond. of polymer electrolyte **membranes**, thereby, when applied to fuel cells, realizes a high performance of fuel cells.

IT **1333-74-0**, Hydrogen, uses **7782-44-7**, Oxygen, uses
(method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM H01M008-10
ICS C08J005-22; H01M004-88; B05D005-12
INCL 429033000; 521027000; 427115000; 502101000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 39, 56, 72, 76
ST manuf composite polymer electrolyte **membrane** coated oxide thin film; reactive sputtering film fuel cell polymer composite electrolyte **membrane**; **plasma** enhanced chem vapor deposition film fuel cell **membrane**
IT Ion exchange **membranes**
(Aciplex and Dow-type **membranes**, sulfo-contg.; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT **Membranes**, nonbiological
(composite; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Fluoropolymers, uses
(ethene-propene copolymers; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Polyoxyalkylenes, uses
(fluorine- and sulfo-contg., ionomers, Nafion; method to manuf. composite polymer electrolyte **membranes** coated with

inorg. thin films for fuel cells)
IT Ionomers
(fluoropolymers, sulfo-contg., styrene-based, BAM type **membranes**; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Fluoropolymers, uses
(ionomers, sulfo-contg., styrene-based, BAM type **membranes**; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Polymer electrolytes
Reactive sputtering
Steam
Ultrathin films
(method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Silicalites (zeolites)
Zeolite-group minerals
(method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Ionic conductivity
(of composite polymer electrolyte **membranes**; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Permeability
(of methanol through composite polymer electrolyte **membranes**; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Vapor deposition process
(**plasma**; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Polyketones
(polyether-, sulfonated; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Polysulfones, uses
(polyimide-, sulfonated; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Polyethers, uses
(polyketone-, sulfonated; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT **Membranes**, nonbiological
(polymer electrolyte, Flemion; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)
IT Fuel cells
(polymer electrolyte; method to manuf. composite polymer

electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT Fluoropolymers, uses
(polyoxyalkylene-, sulfo-contg., ionomers, Nafion; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT Ionomers
(polyoxyalkylenes, fluorine- and sulfo-contg., Nafion; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT Polyimides, uses
(polysulfone-, sulfonated; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT **Microwave** heating
(sputtering with; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT Phenolic resins, uses
(sulfo-contg.; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT Polyamides, uses
Polybenzimidazoles
Polymers, uses
(sulfonated; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT Oxides (inorganic), uses
(thin films on polymer **membrane**; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT **Membrane** electrodes
(using composite polymer electrolyte **membranes**; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 7631-86-9P, Silica, uses
(coating on polymer **membrane** and targets; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 1344-28-1P, Alumina, uses
(coating on polymer **membrane**; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT **1333-74-0**, Hydrogen, uses **7782-44-7**, Oxygen, uses
(method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 1314-23-4, Zirconium oxide (ZrO_2), uses 9002-84-0D, Poly(tetrafluoroethene), sulfonated 9002-88-4D, Polyethylene, sulfonated 9003-07-0D, Polypropylene, sulfonated 9003-53-6D, Polystyrene, sulfonated 13463-67-7, Titanium oxide (TiO_2), uses

13772-29-7, Zirconium phosphate (Zr(HPO4)2) 24937-79-9D, Polyvinylidene fluoride, sulfonated 53232-35-2 190673-42-8, Gore-Select
(method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 7440-37-1, Argon, uses
(method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 67-56-1, Methanol, uses
(method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 107-46-0 555-31-7, Aluminum isopropoxide 555-75-9, Aluminum ethoxide 681-84-5, Tetramethylorthosilicate 865-31-6, Aluminum methoxide 1450-14-2, Hexamethyldisilane 1992-48-9, Tetra-isopropylorthosilicate 3085-30-1, Aluminum butoxide 3087-36-3, Titanium ethoxide 4766-57-8, Tetrabutyl orthosilicate 5593-70-4 7245-18-3, Titanium methoxide 23355-24-0, Titanium butoxide
(method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 7429-90-5, Aluminum, uses 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-67-7, Zirconium, uses 14515-04-9
(method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 77950-55-1, Nafion 115
(plain and composites with silica; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 78-10-4, Silicon ethoxide 7440-21-3D, Silicon, org. compds. 7440-32-6D, Titanium, org. compds. 7440-67-7D, Zirconium, org. compds.
(precursor; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

IT 7429-90-5D, Aluminum, org. compds.
(thin films on polymer **membrane**; method to manuf. composite polymer electrolyte **membranes** coated with inorg. thin films for fuel cells)

L65 ANSWER 2 OF 19 HCA COPYRIGHT 2006 ACS on STN
142:24666 Coating and surface treatment processes for strongly adherent surface coatings. Wolf, Jean-Pierre; Kunz, Martin (Ciba Specialty Chemicals Holding Inc., Switz.). PCT Int. Appl. WO 2004103580 A1 20041202, 72 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN,

YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2004-EP50806 20040514. PRIORITY: CH 2003-928 20030523.

AB In a process for the prodn. of a strongly adherent coating on an inorg. or org. substrate, wherein (a), a low-temp. **plasma** treatment, a corona discharge treatment or a flame treatment is carried out on the inorg. or org. substrate, (b) one or more photoinitiators or mixts. of photoinitiators with monomers or/and oligomers, contg. at least one ethylenically unsatd. group, or solns., suspensions or emulsions of the afore-mentioned substances, are applied to the inorg. or org. substrate, and optionally, (c) using suitable methods those afore-mentioned substances are dried and/or are irradiated with **electromagnetic waves** , it proves advantageous to use compds. of formula (I), (II), (III) and/or (IV), IN-L-RG (I), IN-L-RG1-L1-H (II), IN-L-RG1-L1-IN1 (III), IN-L-RG1-L1-RG2-L2-IN1 (IV), wherein IN and IN1 are each independently of the others a monacylphosphine, monoacylphosphine oxide or monoacylphosphine sulfide photoinitiator group; L1 L1 and L2 are a single bond or a spacer group; RG is a monovalent radical having at least one ethylenically unsatd. C = C bond; and RG1 and RG2 are each independently of the other a divalent radical having at least one ethylenically unsatd. C = C bond.

IT **1333-74-0**, Hydrogen, uses **7732-18-5**, **Water** , uses **7782-44-7**, Oxygen, uses
(**plasma gas**; coating and surface treatment processes for strongly adherent surface coatings)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM B05D003-14
ICS B05D003-08; C07F009-50; C07F009-53
CC 42-2 (Coatings, Inks, and Related Products)

IT Coating materials
Coating process
Electric corona
Flame
Plasma
(coating and surface treatment processes for strongly adherent surface coatings)
IT Air
(**plasma** gas; coating and surface treatment processes for strongly adherent surface coatings)
IT 124-38-9, Carbon dioxide, uses **1333-74-0**, Hydrogen, uses 7439-90-9, Krypton, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7440-63-3, Xenon, uses 7727-37-9, Nitrogen, uses **7732-18-5**, **Water**, uses **7782-44-7**, Oxygen, uses
(**plasma gas**; coating and surface treatment processes for strongly adherent surface coatings)

L65 ANSWER 3 OF 19 HCA COPYRIGHT 2006 ACS on STN
140:345634 Modeling of chemical kinetics in inductively coupled **plasma** torches. Pelletier, D.; Delannoy, Y.; Proulx, P. (EPM, ENSHMG, Saint Martin d'Heres, F-38402, Fr.). International Conference on Electromagnetic Processing of Materials, 4th, Lyon, France, Oct. 14-17, 2003, 330-335. Forum Editions: Paris, Fr. (English) **2003**. CODEN: 69FIFN.
AB This paper presents some of the preliminary numerical results obtained from a two-dimensional FLUENT based model to calc. the **electromagnetic field** and the reactive flow in inductively coupled **plasma** torches. Six different species (H2, O2, H2O, OH, H, O) were introduced together with four reversible chem. reactions to represent a transferred **plasma** used for silicon purifn. The model shows that a significant quantity of reactive radicals (OH, O, H) is present near the liq. silicon target, increasing in this way the probability to produce volatile compds. at the free surface by interaction with dissolved impurities, and so to speed up the purifn. process.
IT **1333-74-0**, Hydrogen, reactions **7732-18-5**, Water, reactions **7782-44-7**, Oxygen, reactions
(modeling of chem. kinetics in inductively coupled **plasma** torches)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 65, 76
ST modeling chem kinetics inductively coupled **plasma** torch silicon purifn
IT **Plasma** torches
(inductively coupled; modeling of chem. kinetics in inductively coupled **plasma** torches)
IT **Plasma**
Reaction kinetics
Simulation and Modeling
Surface reaction
(modeling of chem. kinetics in inductively coupled **plasma** torches)
IT Radicals, reactions
(modeling of chem. kinetics in inductively coupled **plasma** torches)
IT **1333-74-0**, Hydrogen, reactions 3352-57-6, Hydroxyl, reactions **7732-18-5**, Water, reactions **7782-44-7**, Oxygen, reactions 12385-13-6, Atomic hydrogen, reactions 17778-80-2, Atomic oxygen, reactions
(modeling of chem. kinetics in inductively coupled **plasma** torches)
IT 7440-21-3P, Silicon, processes
(modeling of chem. kinetics in inductively coupled **plasma** torches)

L65 ANSWER 4 OF 19 HCA COPYRIGHT 2006 ACS on STN
139:335066 Method and apparatus for **plasma** deposition of chemically reactive groups on substrates chemically reactive substrates obtainable by the method and use thereof. Christensen, Soren Flygenring; Petersen, Steen Guldager (NKT Research & Innovation A/s, Den.). PCT Int. Appl. WO 2003090939 A1 **20031106**, 70 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG,

SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-DK272 20030425. PRIORITY: DK 2002-637 20020425.

AB The present invention relates to a method and app. for **plasma** deposition of a chem. reactive group (Y-Z) on a substrate, chem. reactive substrates, and use thereof, e.g. for immobilization of biomols.; the method comprising: (a) providing at least one precursor (A-X (Y)) for the chem. reactive group; (b) providing at least one donor (D(Z)), said at least one donor comprising at least one addn. group (Z), optionally said at least one addn. group (Z) being comprised in said precursor (A-X (Y)) and optionally said at least one donor (D(Z)) is not being provided; (c) providing a substrate (M); (d) providing a gas **plasma**, said gas **plasma** having a pressure and an energy to form at least one activated carrier group (B); and (e) reacting said substrate (M), said at least one precursor (A-X (Y)), said at least one donor (D(Z)) in said gas **plasma** so that said chem. reactive group (Y-Z) is bound to said substrate, either directly (M-Y-Z) or via said at least one activated carrier group (M-B-Y-Z), and so that when exposed to a substance which chem. reacts with said chem. reactive group, said substance binds thereto.

IT **1333-74-0**, Hydrogen, reactions **7732-18-5**, Water, reactions **7782-44-7D**, Oxygen, compds. contg.
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM B05D007-24
ICS A61L033-00; H05H001-24; H01J037-32

CC 9-1 (Biochemical Methods)
ST app **plasma** deposition chem reactive group substrate
IT Functional groups
(Active; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Frequency
(Audio; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Functional groups
Molecules
(Chem. reactive; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Aldehydes, reactions
Esters, reactions
Ketones, reactions
(Chlorinated; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Functional groups
(Cleaving; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Sensors
(DNA; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Molecules
(Environmental; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Frequency
(**Microwave**; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Thioethers
(Satd. heterocyclic; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Nitriles, reactions
(Satd.; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)
IT Thioethers
(Unsatd. heterocyclic; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive

substrates obtainable by the method and use thereof)

IT Thioethers
(Unsatd. substituted heterocyclic; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Nitriles, reactions
Thioethers
(Unsatd.; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Nitriles, reactions
(arom.; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Apparatus
Atoms
Bond
Bond cleavage
Cantilevers (components)
Carbonyl group
Carriers
Containers
Crystals
Electric current
Electric insulators
Electrodes
Energy
Frequency
Gases
Holders
Immobilization, molecular or cellular
Membranes, nonbiological
Pipes and Tubes
Plasma
Plates
Pressure
Reaction
Sensors
Spheres
Sulfhydryl group
Vacuum
Vacuum pumps
Wires
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT DNA

(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Biochemical compounds
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Amines, reactions
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Carboxylic acids, reactions
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Esters, reactions
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Fibers
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Lactones
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Monomers
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Nitriles, reactions
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Electric generators
(power supplies; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Amines, reactions
(secondary, Heterocyclic, satd.; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Amines, reactions
(secondary, Satd. substituted heterocyclic; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use

thereof)

IT Amines, reactions
(secondary, Satd.; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Amines, reactions
(secondary, Unsatd. heterocyclic; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Amines, reactions
(secondary, Unsatd. substituted heterocyclic; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Amines, reactions
(secondary, Unsatd.; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Amines, reactions
(secondary; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Amines, reactions
(tertiary; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT Esters, reactions
(unsatd.; method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

IT 74-82-8, Methane, reactions 75-00-3, Ethyl chloride 75-05-8, Acetonitrile, reactions 75-43-4, Dichlorofluoromethane 75-44-5, Carbonyl chloride 75-69-4, Trichlorofluoromethane 80-62-6, Methyl methacrylate 96-54-8, 1-Methylpyrrole 97-62-1, Ethyl isobutyrate 100-47-0, Benzonitrile, reactions 102-70-5, Triallylamine 107-13-1, Acrylonitrile, reactions 107-47-1, tert-Butyl sulfide 108-29-2, γ-Valerolactone 109-74-0, n-Butanenitrile 109-89-7, Diethylamine, reactions 109-97-7, Pyrrole 110-01-0, Tetrahydrothiophene 110-02-1, Thiophene 110-86-1, Pyridine, reactions 110-89-4, Piperidine, reactions 120-94-5, 1-Methylpyrrolidine 121-44-8, Triethylamine, reactions 123-75-1, Pyrrolidine, reactions 124-02-7, Diallylamine 141-78-6, Ethyl acetate, reactions 288-13-1, Pyrazole 288-32-4, Imidazole, reactions 289-95-2, Pyrimidine 547-63-7, Methyl isobutyrate 554-14-3, 2-Methylthiophene 592-88-1, Allyl sulfide 616-43-3, 3-Methylpyrrole 623-47-2, Ethyl propiolate 625-82-1, 2,4-Dimethylpyrrole 627-37-2, N-Allylmethylamine 638-02-8,

2,5-Dimethylthiophene 922-67-8, Methyl propiolate 1072-63-5, N-Vinylimidazole 1300-21-6, Dichloroethane **1333-74-0**, Hydrogen, reactions 3068-88-0, β-Butyrolactone 7664-41-7, Ammonia, reactions 7704-34-9D, Sulfur, compds. contg. 7727-37-9D, Nitrogen, compds. contg. **7732-18-5**, Water, reactions **7782-44-7D**, Oxygen, compds. contg. 7782-50-5D, Chlorine, mols. contg. 10152-76-8, Allyl methyl sulfide 26446-76-4, Chloropropane 26638-19-7, Dichloropropane
(method and app. for **plasma** deposition of chem. reactive groups on substrates chem. reactive substrates obtainable by the method and use thereof)

L65 ANSWER 5 OF 19 HCA COPYRIGHT 2006 ACS on STN
139:8735 nanopowder production system. Wu, L. W.; Huang, Wen-Chiang (USA). U.S. Pat. Appl. Publ. US 2003108459 A1 **20030612**, 14 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-6378 20011210.

AB A system for synthesizing a nano-scaled powder material, includes several sub-systems: (A) a chamber for contg. nano-scaled cluster generating devices from a material selected from the group consisting of a metal, a metal compd., and a ceramic; (B) a twin-wire electrode device disposed within this chamber with this electrode device including: (1) two wires made up of this material, each having a leading tip and each being continuously or intermittently fed into the chamber in such a fashion that the two leading tips are maintained at a desired sepn.; and (2) power supply for providing elec. current and gas supply for providing a working gas flow for creating an ionized arc between the two leading tips for melting and/or vaporizing the material to generate nano-scaled clusters; (C) devices for injecting a quench gas and/or a reaction gas into a quenching/reaction zone inside the chamber at a point downstream from the arc to produce nano-scaled powder particles; and (D) devices such as a cyclone and powder classifier to collect the nano-scaled powder material.

IT **7553-56-2**, Iodine, processes **7782-44-7**, Oxygen, processes
(reaction gas; nanopowder prodn. system)

RN 7553-56-2 HCA
CN Iodine (8CI, 9CI) (CA INDEX NAME)

I—I

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **1333-74-0**, Hydrogen, uses
(working gas; nanopowder prodn. system)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IC ICM B01J019-08
INCL 422186040; 422186290
CC 48-11 (Unit Operations and Processes)
IT **Plasma**
(arc; nanopowder prodn. system)
IT Air
Water vapor
(quench **gas**; nanopowder prodn. system)
IT 7440-38-2, Arsenic, processes **7553-56-2**, Iodine, processes
7704-34-9, Sulfur, processes 7723-14-0, Phosphorus, processes
7726-95-6, Bromine, processes 7727-37-9, Nitrogen, processes
7782-41-4, Fluorine, processes **7782-44-7**, Oxygen,
processes 7782-49-2, Selenium, processes 7782-50-5, Chlorine,
processes 13494-80-9, Tellurium, processes
(reaction gas; nanopowder prodn. system)
IT **1333-74-0**, Hydrogen, uses
(working gas; nanopowder prodn. system)

L65 ANSWER 6 OF 19 HCA COPYRIGHT 2006 ACS on STN
138:361446 Design of field emission devices using modified carbon
nanotubes. Takai, Mikio; Fischer, Alan B.; Niu, Chunming; Tennent,
Howard G.; Hoch, Robert; Biebuyck, Hans (Hyperion Catalysis
International, Inc., USA). U.S. Pat. Appl. Publ. US 2003090190 A1
20030515, 33 pp. (English). CODEN: USXXCO. APPLICATION:
US 2002-171760 20020614. PRIORITY: US 2001-298193P 20010614.
AB The invention relates to the design of field emission devices using
modified carbon nanotubes, where the carbon nanotubes are used to
form the cathode. The device consists of an anode and a cathode,
where the cathode includes carbon nanotubes, which have been
subjected to an energy, **plasma**, chem., or mech. treatment.
IT **7782-44-7**, Oxygen, processes
(ions, **plasma** carbon nanotubes treated with; design of
field emission devices using modified carbon nanotubes)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT 1333-74-0, Hydrogen, processes
(ions, **plasma**, carbon nanotubes treated with; design of field emission devices using modified carbon nanotubes)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT 7732-18-5, Water, processes
(**plasma**, carbon nanotubes treated with; design of field emission devices using modified carbon nanotubes)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IC ICM H01J001-05
ICS H01J001-38
INCL 313311000
CC 76-12 (Electric Phenomena)
Section cross-reference(s): 41, 73, 74
IT Atomic beams
Chemisorbed substances
Chemisorption
Electromagnetic wave
Electron beams
Electrophiles
Gamma ray
Heat treatment
Ion beams
Ionizing radiation
Laser radiation
Microwave
Molecular beams
Nucleophiles
Oxidizing agents
Plasma
Reducing agents
UV radiation
X-ray
(carbon nanotubes treated with; design of field emission devices using modified carbon nanotubes)
IT **7782-44-7**, Oxygen, processes
(ions, **plasma** carbon nanotubes treated with; design of field emission devices using modified carbon nanotubes)
IT **1333-74-0**, Hydrogen, processes 7440-37-1, Argon, processes

7440-59-7, Helium, processes
(ions, **plasma**, carbon nanotubes treated with; design of field emission devices using modified carbon nanotubes)

IT 74-85-1, Ethylene, processes 75-46-7, Fluoroform 75-63-8, Bromo-trifluoromethane 75-71-8, Difluoro-dichloromethane 75-72-9, Chlorotrifluoromethane 75-73-0, Carbon tetrafluoride 116-14-3, Perfluoroethylene, processes 2551-62-4, Sulfur hexafluoride 7664-41-7, Ammonia, processes 7727-37-9, Nitrogen, processes **7732-18-5**, Water, processes
(**plasma**, carbon nanotubes treated with; design of field emission devices using modified carbon nanotubes)

L65 ANSWER 7 OF 19 HCA COPYRIGHT 2006 ACS on STN

137:248831 Production of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle. Ryu, Seung-Kyun; Su, Kon (S. Korea). PCT Int. Appl. WO 2002075020 A1 **20020926**, 32 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-KR382 20020306. PRIORITY: KR 2001-11334 20010306.

AB A method for plating the surface of a polymer material with a metal film comprises treatment of the polymer surface with cold **plasma** to introduce hydrophilic functional groups and plating the surface of the polymer material with a metal film according to the electroless plating method. The cold **plasma** treatment reduces water contact angle of the polymer surface by 5 to 60°. Addnl. step of immersing the polymer material into an org. solvent for 0.1 to 5 min or of washing the polymer material with ultrasonic washing machine can be used after introducing the hydrophilic functional groups by cold **plasma** -treatment. The method is very stable and can endow new properties to the polymer material, such as improvement of appearance, mech. properties, heat resistance, rendering heat and elec. cond., soldering ability and **electromagnetic wave** shielding effect. The polymer materials plated by this method can be used for shielding **electromagnetic waves** generated from the information processing equipment, prepg. printed circuit boards, electrodes and antistatic boards. Thus, the surface of polypropylene (PP) was treated for 3 min at 15° with cold **plasma** generated in the mixt. of acrylic acid, oxygen and methane. The water contact angle of PP was reduced from 90° to 8.5°. The treated polymer was used to form copper film on

the surface by electroless plating using palladium as catalytically activated phase.

IT **1333-74-0**, Hydrogen, uses **7732-18-5**, Water, uses
7782-44-7, Oxygen, uses
(cold **plasma**; prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM C23C016-44
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76
ST electroless plating metal coating treated polymer surface; polymer cold **plasma** treatment hydrophilic surface metal film prodn
IT Air
(cold **plasma**; prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)
IT Coating process
(electroless; prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)
IT Printed circuit boards
(metal films on cold **plasma**-treated polymer surfaces for prodn. of)
IT Cold **plasma**
(prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)
IT Polycarbonates, uses
Polyesters, uses
Polyimides, uses
Silicone rubber, uses
(prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)
IT Acrylic polymers, uses

Epoxy resins, uses
Fluoropolymers, uses
Rubber, uses
(prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)

IT 50-00-0, Formalin, uses 67-64-1, Acetone, uses 74-82-8, Methane, uses 75-07-0, Acetaldehyde, uses 79-10-7, Acrylic acid, uses **1333-74-0**, Hydrogen, uses 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses **7732-18-5**, Water, uses **7782-44-7**, Oxygen, uses
(cold **plasma**; prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)

IT 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-31-5, Tin, uses
(in prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)

IT 9002-84-0, Polytetrafluoroethylene 9002-86-2, Polyvinyl chloride 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9003-53-6, Polystyrene 25038-59-9, Poly(ethylene terephthalate), uses
(prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)

IT 9003-56-9, Acrylonitrile-butadiene-styrene copolymer
(prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)

IT 7440-02-0, Nickel, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses
(prodn. of metal films on polymer surfaces treated with cold **plasma** to reduce contact angle)

136:202788 Conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method. Okumoto, Mamoru; Mizuno, Akira (Department of Ecological Engineering, Toyohashi University of Technology, Toyohashi, Tempaku-cho, Aichi, 441-8580, Japan). Catalysis Today, 71(1-2), 211-217 (English) **2001.** CODEN: CATTEA. ISSN: 0920-5861. Publisher: Elsevier Science B.V..

AB This paper presents new conversion method of methane to higher hydrocarbon fuels such as MeOH (methanol), formaldehyde, using pulsed discharge **plasma** under room temp. and atm. pressure. The expts. were carried out with special attention to the effect of the specific input energy (SIE) defined as the elec. input energy per unit mass of the material gas. In the study of partial oxidn. of methane, exptl. results indicated that the methanol and formaldehyde prodn. has an optimum SIE value. The highest methanol and formaldehyde prodn. ability and reaction selectivity were achieved with relatively low SIE of 360 J/l, based on feed gas. Under this optimum condition, a max. prodn. ability of .apprx.0.65 μmol/J and selectivity of 64% were obtained. However, to achieve

selective reaction of methane, conversion of methane with halogen materials to Me halide such as Me iodine was also studied. In the expt., max. Me iodine prodn. selectivity of 95% was achieved with the prodn. ability of 0.45 μmol/J.

IT **1333-74-0**, Hydrogen, formation (nonpreparative) **7732-18-5**, Water, formation (nonpreparative)
(conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **7553-56-2**, Iodine, reactions **7782-44-7**, Oxygen, reactions
(conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

RN 7553-56-2 HCA

CN Iodine (8CI, 9CI) (CA INDEX NAME)

I—I

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 51-11 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 45

ST methane hydrocarbon fuel pulsed discharge **plasma** partial oxidn; methanol formaldehyde methyl iodide

IT **Plasma**
(conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

IT Hydrocarbons, formation (nonpreparative)
(conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

IT Natural gas, reactions
(conversion of methane for higher hydrocarbon fuel synthesis

using pulsed discharge **plasma** method)

IT Halogenation
(for CH4 oxidn. selectivity improvement; conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

IT Hydrocarbons, preparation
(oxy; conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

IT Oxidation
(partial; conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

IT Reactors
(**plasma**; conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

IT Electric discharge
(pulsed; conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

IT 74-84-0, Ethane, formation (nonpreparative) 74-85-1, Ethylene, formation (nonpreparative) 75-07-0, Acetaldehyde, formation (nonpreparative) 124-38-9, Carbon dioxide, formation (nonpreparative) 630-08-0, Carbon monoxide, formation (nonpreparative) **1333-74-0**, Hydrogen, formation (nonpreparative) **7732-18-5**, Water, formation (nonpreparative)
(conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

IT 50-00-0P, Formaldehyde, preparation 67-56-1P, Methanol, preparation 74-88-4P, Methyl iodide, preparation
(conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

IT 74-82-8, Methane, reactions **7553-56-2**, Iodine, reactions **7782-44-7**, Oxygen, reactions
(conversion of methane for higher hydrocarbon fuel synthesis using pulsed discharge **plasma** method)

L65 ANSWER 9 OF 19 HCA

136:143637 Method of forming a metal wiring in a semiconductor device. Pyo, Sung Gyu (S. Korea). U.S. Pat. Appl. Publ. US 2002009884 A1 **20020124**, 6 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-874505 20010605. PRIORITY: KR 2000-33984 20000620.

AB A method of forming a metal wiring in a semiconductor device is presented. A Cu wiring is formed by means of CECVD method by which a chem. enhancer layer is used for increasing the deposition speed of Cu. The damascene pattern is filled by means of MOCVD method using a Cu precursor to increase the deposition speed. The chem. enhancer layer rises to the surface of Cu after deposition of Cu by a CECVD method and then the relatively high resistivity chem. enhancer layer that has risen to the surface of Cu by **plasma**

process is removed. Therefore, the ultra-fine damascene pattern can be rapidly filled with Cu without increasing the resistance of the Cu wiring.

IT **7553-56-2**, Iodine, uses
(catalyst for chem. enhancer layer formation; method of forming a copper metal wiring in a semiconductor device by vapor deposition method)

RN 7553-56-2 HCA

CN Iodine (8CI, 9CI) (CA INDEX NAME)

I—I

IT **1333-74-0**, Hydrogen, processes **7782-44-7**, Oxygen, processes
(vapor deposition ambient; method of forming a copper metal wiring in a semiconductor device by vapor deposition method)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM H01L021-44

INCL 438687000

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 29, 75

IT **Water vapor**
(catalyst for chem. enhancer layer formation; method of forming a copper metal wiring in a semiconductor device by vapor deposition method)

IT Vapor deposition process
(**plasma**; method of forming a copper metal wiring in a semiconductor device by vapor deposition method)

IT 74-88-4, Iodomethane, uses 75-03-6, Iodoethane 75-11-6, Diiodomethane 754-05-2, Trimethylvinylsilane 865-50-9 1522-22-1 7440-68-8, Astatine, uses **7553-56-2**, Iodine, uses 7726-95-6, Bromine, uses 7782-41-4, Fluorine, uses 7782-50-5, Chlorine, uses
(catalyst for chem. enhancer layer formation; method of forming a copper metal wiring in a semiconductor device by vapor deposition method)

IT **1333-74-0**, Hydrogen, processes 7440-37-1, Argon, processes 7664-41-7, Ammonia, processes 7727-37-9, Nitrogen, processes **7782-44-7**, Oxygen, processes 10028-15-6, Ozone, processes
(vapor deposition ambient; method of forming a copper metal wiring in a semiconductor device by vapor deposition method)

L65 ANSWER 10 OF 19 HCA COPYRIGHT 2006 ACS on STN
135:335394 New chemical species of a magnecule. Santilli, Ruggero Maria (Hadronic Press, Inc., USA). U.S. Pat. Appl. Publ. US 20010038087 A1 **20011108**, 60 pp., Cont.-in-part of U.S. Ser. No. 586,926. (English). CODEN: USXXCO. APPLICATION: US 2001-826183 20010404. PRIORITY: US 1994-254377 19940606; US 1997-785797 19970121; US 1998-106170 19980629; US 1998-133348 19980813; US 1999-372278 19990811; US 2000-586926 20000605.

AB A novel chem. species, called magnecules, which is composed of clusters of mols., and/or dimers, and/or atoms formed by internal bonds due to the magnetic polarization of the orbits of at least some of the peripheral at. electrons present in the cluster, the intrinsic magnetic field of nuclei present in the cluster, and the intrinsic magnetic fields of valence electrons present in the cluster that are not correlated in singlet couplings to other electrons to form valence bonds is disclosed.

IT **1333-74-0**, Hydrogen, properties **7732-18-5**, Water, properties **7782-44-7**, Oxygen, properties
(new chem. species of magnecule composed of clusters of)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM C09K003-00
INCL 252062510R
CC 65-5 (General Physical Chemistry)
Section cross-reference(s): 51, 73, 77
IT Electric furnaces

(arc, **plasma**; new chem. species of magnecule composed of clusters of mols., dimers, and/or atoms formed by passing through)

IT **Electromagnetic field**
(new chem. species of magnecule composed of clusters of mols., dimers, and/or atoms with internal bonds due to magnetic polarization by)

IT 124-38-9, Carbon dioxide, properties 630-08-0, Carbon monoxide, properties **1333-74-0**, Hydrogen, properties 3315-37-5, Methylidyne **7732-18-5**, Water, properties **7782-44-7**, Oxygen, properties 12385-13-6, properties
(new chem. species of magnecule composed of clusters of)

L65 ANSWER 11 OF 19 HCA

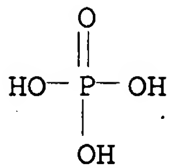
131:326978 Method for detoxification of moist wastes containing oxidizable organic materials by drying and oxidation under UV irradiation. Laflamme, Claude B.; Labrecque, Raynald (Hydro-Quebec, Can.). PCT Int. Appl. WO 9958459 A1 **19991118**, 26 pp. DESIGNATED STATES: W: AL, AU, BA, BB, BG, BR, CN, CU, CZ, EE, GD, GE, HR, HU, ID, IL, IN, IS, JP, KP, KR, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, SL, TR, TT, UA, UZ, VN, YU, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (French). CODEN: PIXXD2. APPLICATION: WO 1999-CA79 19990129. PRIORITY: CA 1998-2237414 19980511.

AB Moist org. wastes are oxidized and dried by feeding into a rotary kiln provided with a refractory coating and contg. a heat transferring material; then heating the waste mixed with the heat transferring material at ≥300°C (300-900°C) in the presence of chem. active species (e.g., **H3PO4**, FeSO4, oxides, hydroxides, carbonates, phosphates) and elec. generated UV irradn. for dewatering and oxidn. of the org. materials with gas formation. The kiln is rotated and heated by a **plasma** torch, elec. arc, or elec. discharge device. The oxidn. is promoted and catalyzed by the chem. active species and the UV radiation. The gases are evacuated from the kiln. The method provides inexpensive destruction of polluting and/or oxidizable toxic materials.

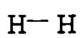
IT **7664-38-2, Phosphoric acid**, uses
(drying and oxidn. of moist org. wastes in rotary kilns under UV irradn.)

RN 7664-38-2 HCA

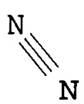
CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



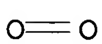
IT **1333-74-0**, Hydrogen, uses **7727-37-9**, Nitrogen,
uses **7782-44-7**, Oxygen, uses
(**plasma** torch; drying and oxidn. of moist org. wastes
in rotary kilns under UV irradn.)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)



RN 7727-37-9 HCA
CN Nitrogen (8CI, 9CI) (CA INDEX NAME)



RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)



IT **7732-18-5**, **Water**, uses
(**vapor**, **plasma** torch; drying and oxidn. of
moist org. wastes in rotary kilns under UV irradn.)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IC ICM C02F011-06
ICS C02F001-32; F23G005-10; F23G005-20; F23G007-00; A62D003-00
CC 60-4 (Waste Treatment and Disposal)
IT **7664-38-2**, **Phosphoric acid**, uses
7720-78-7, Ferrous sulfate
(drying and oxidn. of moist org. wastes in rotary kilns under UV
irradn.)

IT 74-82-8, Methane, uses 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses **1333-74-0**, Hydrogen, uses 7440-37-1, Argon, uses **7727-37-9**, Nitrogen, uses **7782-44-7**, Oxygen, uses
(**plasma** torch; drying and oxidn. of moist org. wastes in rotary kilns under UV irradn.)
IT **7732-18-5**, **Water**, uses
(**vapor**, **plasma** torch; drying and oxidn. of moist org. wastes in rotary kilns under UV irradn.)

L65 ANSWER 12 OF 19 HCA COPYRIGHT 2006 ACS on STN
131:280224 Etching low-k dielectrics. Yan, Chun; Hsueh, Gary C.; Ye, Yan; Ma, Diana Xiaobing (Applied Materials, Inc., USA). PCT Int. Appl. WO 9952135 A1 **19991014**, 45 pp. DESIGNATED STATES: W: JP, KR, SG; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1999-US7152 19990331. PRIORITY: US 1998-54285 19980402.
AB The disclosure pertains to a method for **plasma** etching of low-k materials, particularly org. polymer-based low-k materials. The method employs an etchant **plasma** where the major etchant species are generated from a halogen other than F and O. The preferred halogen is Cl. The volumetric (flow rate) or at. ratio of the halogen:O in the **plasma** source gas ranges from .apprx.1:20 to .apprx.20:1. When the halogen is Cl, the preferred at. ratio of Cl:O ranges from .apprx.1:10 to .apprx.5:1. When this at. ratio for Cl:O is used, the etch selectivity for the low-k material over adjacent O-comprising or N-comprising layers is advantageous, typically .gtorsim.10:1. The **plasma** source gas may contain additives in an amt. of ≤15% by vol. which are designed to improve selectivity for the low-k dielec. over an adjacent material, to provide a better etch profile, or to provide better crit. dimension control.
IT **1333-74-0**, Hydrogen, processes **7553-56-2**, Iodine, processes **7732-18-5**, Water, processes **7782-44-7**, Oxygen, processes
(**plasma** etching low-k dielecs. in gases contg.)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7553-56-2 HCA
CN Iodine (8CI, 9CI) (CA INDEX NAME)

I—I

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM H01L021-311
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 38
ST **plasma** etching dielec; halogen oxygen **plasma** etching polymeric dielec
IT Polyethers, processes
(arom., fluorinated; **plasma** etching low-k dielecs. from)
IT Polyethers, processes
(arom., oxazoles; **plasma** etching low-k dielecs. from)
IT Polyethers, processes
(arom., poly(arylene) ethers; **plasma** etching low-k dielecs. from)
IT Electric insulators
(**plasma** etching low-k dielecs.)
IT Fluoropolymers, processes
Polybenzoxazoles
Polyimides, processes
Polymers, processes
Polyoxyphenylenes
(**plasma** etching low-k dielecs. from)
IT Halogens
Hydrocarbons, processes
(**plasma** etching low-k dielecs. in gases contg.)
IT Etching
(**plasma**; **plasma** etching low-k dielecs.)
IT Polyquinoxalines
(polyphenylquinoxalines; **plasma** etching low-k dielecs. from)
IT Etching
(selective; in **plasma** etching low-k dielecs.)
IT 25669-37-8
(Parylene AF, Parylene F; **plasma** etching low-k dielecs. from)
IT 697-11-0, Perfluorocyclobutene 3345-29-7 9002-84-0 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9003-53-6, Polystyrene

25038-76-0, Polynorbornene 25722-33-2, Parylene-N 36605-57-9
124221-30-3, Cyclotene 181997-50-2, FPI-136M 203945-07-7, SiLK
213329-13-6, Flare 2.0
(**plasma** etching low-k dielecs. from)

IT 56-23-5, processes 64-17-5, Ethanol, processes 67-56-1, Methanol, processes 67-66-3, Chloroform, processes 74-83-9, Bromomethane, processes 75-44-5, Phosgene 75-46-7, Trifluoromethane 75-73-0 76-06-2, Trichloronitromethane 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes 1300-21-6, Dichloroethane **1333-74-0**, Hydrogen, processes 7439-90-9, Krypton, processes 7440-01-9, Neon, processes 7440-37-1, Argon, processes 7440-59-7, Helium, processes 7440-63-3, Xenon, processes **7553-56-2**, Iodine, processes 7647-01-0, Hydrogen chloride, processes 7726-95-6, Bromine, processes 7727-37-9, Nitrogen, processes **7732-18-5**, Water, processes **7782-44-7**, Oxygen, processes 7782-50-5, Chlorine, processes 7783-54-2, Nitrogen fluoride (NF3) 7789-33-5, Iodine bromide (IBr) 7790-99-0, Iodine chloride (ICl) 10024-97-2, Nitrogen oxide (N2O), processes 10026-04-7, Silicon chloride (SiCl4) 10028-15-6, Ozone, processes 10034-85-2, Hydrogen iodide 10035-10-6, Hydrogen bromide, processes 10102-44-0, Nitrogen dioxide, processes 10294-34-5, Boron chloride (BCl3) 13863-41-7, Bromine chloride (BrCl) 25323-30-2, Dichloroethene 25323-89-1, Trichloroethane 55299-13-3, Dibromodichloroethane
(**plasma** etching low-k dielecs. in gases contg.)

IT 7631-86-9, Silica, processes 11105-01-4, Silicon nitride oxide 12033-89-5, Silicon nitride, processes
(**plasma** etching low-k dielecs. in relation to)

IT 25135-16-4D, Polynaphthalene, derivs.
(polynaphthalene-N, polynaphthalene-F; **plasma** etching low-k dielecs. from)

L65 ANSWER 13 OF 19 HCA COPYRIGHT 2006 ACS on STN

130:260787 Cleaning of contamination from electron-emissive elements. Knall, N. Johan; Porter, John D.; Stanners, Colin D.; Spindt, Christopher J.; Bascom, Victoria A. (Candescent Technologies Corporation, USA). PCT Int. Appl. WO 9917323 A2 **19990408**, 38 pp. DESIGNATED STATES: W: JP, KR; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US18509 19980922. PRIORITY: US 1997-940873 19970930.

AB Multiple procedures are presented for removing contaminant material from electron-emissive elements of an electron-emitting device. One procedure involves converting the contaminant material into gaseous products, typically by operating the electron-emissive elements, that move away from the electron-emissive elements. Another procedure entails converting the contaminant material into further

material and removing the further material. An addnl. procedure involves forming surface coatings over the electron-emissive elements. The contaminant material is then removed directly from the surface coatings or by removing at least part of each surface coating.

IT **1333-74-0**, Hydrogen, uses **7553-56-2**, Iodine, uses **7732-18-5**, Water, uses **7782-44-7**, Oxygen, uses
(in cleaning of contamination from electron-emissive elements)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7553-56-2 HCA
CN Iodine (8CI, 9CI) (CA INDEX NAME)

I—I

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM H01J
CC 76-12 (Electric Phenomena)
Section cross-reference(s): 66
IT Cleaning
(**plasma**; cleaning of contamination from electron-emissive elements)
IT 50-00-0, Methanal, uses 56-23-5, Carbon tetrachloride, uses 64-18-6, Formic acid, uses 64-19-7, Acetic acid, uses 66-25-1, Hexanal 67-56-1, Methanol, uses 67-64-1, Acetone, uses 67-66-3, Trichloromethane, uses 74-82-8, Methane, uses 74-85-1, Ethene, uses 74-86-2, Ethyne, uses 74-87-3, Chloromethane, uses 75-09-2, Dichloromethane, uses 75-10-5, Difluoromethane 75-73-0, Carbon tetrafluoride 79-09-4, Propionic acid, uses 111-27-3, Hexanol, uses 111-65-9, Octane, uses 124-38-9, Carbon dioxide, uses 302-01-2, Hydrazine, uses 593-53-3, Fluoromethane 630-08-0, Carbon monoxide, uses **1333-74-0**, Hydrogen, uses

7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7440-63-3, Xenon, uses 7446-09-5, Sulfur dioxide, uses **7553-56-2**, Iodine, uses 7637-07-2, Boron trifluoride, uses 7647-01-0, Hydrogen chloride, uses 7664-39-3, Hydrogen fluoride, uses 7664-41-7, Ammonia, uses 7722-84-1, Hydrogen peroxide, uses 7726-95-6, Bromine, uses 7727-37-9, Nitrogen, uses **7732-18-5**, Water, uses 7782-41-4, Fluorine, uses **7782-44-7**, Oxygen, uses 7782-50-5, Chlorine, uses 7783-06-4, Hydrogen sulfide, uses 7783-07-5, Hydrogen selenide 7783-09-7, Hydrogen telluride 7783-54-2, Nitrogen trifluoride 7784-42-1, Arsine 7803-51-2, Phosphorus trihydride 7803-52-3, Stibine 10024-97-2, Nitrous oxide, uses 10028-15-6, Ozone, uses 10034-85-2, Hydrogen iodide 10035-10-6, Hydrogen bromide, uses 10102-43-9, Nitric oxide, uses 10102-44-0, Nitrogen dioxide, uses 17778-80-2, Atomic oxygen, uses 19287-45-7, Diborane 25377-83-7, Octene 30637-87-7, Hexanone 32073-03-3, Octyne

(in cleaning of contamination from electron-emissive elements)

L65 ANSWER 14 OF 19 HCA COPYRIGHT 2006 ACS on STN

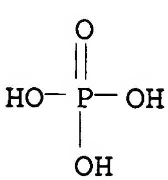
128:263734 Electrochemical device. Giron, Jean-Christophe (Saint-Gobain Vitrage, Fr.). Eur. Pat. Appl. EP 831360 A1 **19980325**, 20 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI. (French). CODEN: EPXXDW. APPLICATION: EP 1997-402158 19970918. PRIORITY: FR 1996-11392 19960918.

AB The invention concerns an electrochem. device contg. at least 1 substrate, at least 1 elec. conductive layer, at least 1 layer which is electrochem. active and susceptible to reversible ion insertion for such cations at H+, Li+, Na+, Ag+, and an electrolyte. The electrolyte contains at least 1 layer of a material which is essentially an oxide-type mineral for which the ionic conduction can be inhibited or amplified by the incorporation of hydrogenated or nitrated compds., notably nitrides.

IT **7664-38-2, Phosphoric acid**, uses
7732-18-5, Water, uses
(electrochem. device applicable to electrochromism and radiation technol. (windows))

RN 7664-38-2 HCA

CN Phosphoric acid (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0**, Hydrogen, uses **7782-44-7**, Oxygen, uses
(electrochem. device applicable to electrochromism and radiation technol. (windows))
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM G02F001-15
ICS H01M006-18; G01N027-416; H01M010-36; H01M010-34
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 52, 72
ST electrochem device electrolyte electrochromism ionic conductor; oxide metal electrochromic electrochem device; nitride electrochromic electrochem device; proton conductor electrochem device electrochromism; lithium conductor electrochem device electrochromism; sodium conductor electrochem device electrochromism; silver conductor electrochem device electrochromism; mineral oxide hydrogenated nitrated electrochem device; deposition electrochem device electrochromism; **plasma** CVD electrochem device electrochromism; spray coating electrochem device electrochromism; automobile window electrochromic electrochem device electrolyte
IT Heteropoly **acids**
(**phosphoric**; electrochem. device applicable to electrochromism and radiation technol. (windows))
IT Vapor deposition process
(**plasma**; electrochem. device applicable to electrochromism and radiation technol. (windows))
IT 302-01-2, Hydrazine, uses 1304-76-3, Bismuth sesquioxide, uses 1310-53-8, Germanium dioxide, uses 1312-43-2, Indium oxide (In2O3) 1313-96-8, Niobium oxide nb2o5 1313-99-1, Nickel monoxide, uses 1314-20-1, Thorium dioxide, uses 1314-23-4, Zirconium dioxide, uses 1314-35-8, Tungsten trioxide, uses 1314-60-9, Antimony

pentoxide 1314-61-0, Tantalum oxide ta2o5 1327-33-9, Antimony oxide 1332-29-2, Tin oxide 7440-57-5, Gold, uses 7631-86-9, Silicon dioxide, uses **7664-38-2, Phosphoric acid**, uses 7722-84-1, Hydrogen peroxide (H2O2), uses **7732-18-5**, Water, uses 9002-98-6, PEI 10024-97-2, Nitrous oxide, uses 11099-11-9, Vanadium oxide 11105-45-6 11118-57-3, Chromium oxide 12055-23-1, Hafnium dioxide 12337-18-7, Tantalum pentoxide hydrate 12586-59-3, Proton 12624-27-0, Rhenium oxide 12645-46-4, Iridium oxide 12712-36-6, Antimony pentoxide hydrate 13463-67-7, Titanium oxide, uses 14701-21-4, Silver(1+), uses 17341-24-1, Lithium 1+, uses 17341-25-2, Sodium(1+), uses 18282-10-5, Tin dioxide 25322-68-3 39300-70-4, Lithium nickel oxide 39406-95-6, Cerium titanium oxide 50926-11-9, ITO 56939-16-3, Antimony oxide hydrate 60866-78-6, Tantalum titanium oxide 104812-37-5, Antimony tungsten oxide hydrate 202847-02-7, Hydrogen nickel oxide 205312-38-5 205396-60-7
(electrochem. device applicable to electrochromism and radiation technol. (windows))

IT **1333-74-0**, Hydrogen, uses 7440-37-1, Argon, uses **7782-44-7**, Oxygen, uses
(electrochem. device applicable to electrochromism and radiation technol. (windows))

L65 ANSWER 15 OF 19 HCA

123:154636 A proposed safety assurance method and its application to the fusion experimental reactor. Okazaki, T.; Seki, Y.; Inabe, T.; Aoki, I. (Naka Fusion Research Establishment, Japan Atomic Energy Research Institute, Naka-machi, Naka-gun, Ibaraki-ken, Japan). Fusion Engineering and Design, 30(3), 201-16 (English) **1995**. CODEN: FEDEEE. ISSN: 0920-3796. Publisher: North-Holland.

AB Importance categorization and hazard identification methods have been proposed for a fusion exptl. reactor. A parameter, the system index, is introduced in the categorization method. The relative importance of systems with safety functions can be classified by the largeness of the system index and whether or not the system acts as a boundary for radioactive materials. This categorization can be used as the basic principle in detg. structure design assessment, seismic design criteria, etc. For the hazard identification the system time energy matrix is proposed, where the time and spatial distributions of hazard energies are used. This approach is formulated more systematically than an ad-hoc identification of hazard events and it is useful to select design basis events which are employed in the assessment of safety designs.

IT **1333-74-0**, Hydrogen, formation (nonpreparative)
(safety assurance method and its application to the fusion exptl. reactors in relation to)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7732-18-5**, Water, reactions
(safety assurance method and its application to the fusion exptl. reactors in relation to)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **7782-44-7**, Oxygen, reactions
(safety assurance method and its application to the fusion exptl. reactors in relation to tritium combustion energy)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 71-2 (Nuclear Technology)
ST fusion reactor safety assurance methodol application; **plasma** fusion safety assurance methodol application; importance categorization fusion reactor; system index importance categorization fusion reactor; hazard identification fusion reactor
IT **Electromagnetic field**
Heat
Nuclear energy
Oxidation
Radioactive substances
(safety assurance method and its application to the fusion exptl. reactors in relation to)
IT **1333-74-0**, Hydrogen, formation (nonpreparative)
(safety assurance method and its application to the fusion exptl. reactors in relation to)
IT **7732-18-5**, Water, reactions
(safety assurance method and its application to the fusion exptl. reactors in relation to)
IT **7782-44-7**, Oxygen, reactions
(safety assurance method and its application to the fusion exptl. reactors in relation to tritium combustion energy)

L65 ANSWER 16 OF 19 HCA COPYRIGHT 2006 ACS on STN
113:153202 Silane refunctionalization of **radio frequency glow discharge** hydrolyzed

ePTFE **membrane** surfaces. Vargo, T. G.; Hook, D. J.; Litwiler, K. S.; Bright, F. V.; Gardella, J. A., Jr. (Univ. Buffalo, Buffalo, NY, 14214, USA). Polymeric Materials Science and Engineering, 62, 259-63 (English) **1990.** CODEN: PMSEDG. ISSN: 0743-0515.

AB Modified PTFE **membranes** were functionalized with OH groups during treatment with H-H2O or H-MeOH **plasma.** The hydrophobicity of the **membranes** was unaffected by **plasma** treatment. **Plasma**-treated modified PTFE **membranes** were silylated with (γ-aminopropyl)triethoxysilane.

IT **7732-18-5**, Water, properties
(**plasma** contg. hydrogen or oxygen and, PTFE deriv. **membranes** hydrolyzed by, wettability of)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **7782-44-7**, Oxygen, properties
(**plasma** contg. hydrogen or water and, PTFE deriv. **membranes** hydrolyzed by, wettability of)

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **1333-74-0**, Hydrogen, reactions
(**plasma** contg., PTFE deriv. **membranes** hydrolyzed by, silylation of)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7732-18-5**
(wettability, of **plasma**-hydrolyzed PTFE deriv. **membranes**, **plasma** type effect on)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 35-8 (Chemistry of Synthetic High Polymers)

ST polytetrafluoroethylene deriv **membrane plasma** treatment; silylation **plasma** treated polytetrafluoroethylene **membrane**; wettability PTFE **membrane plasma** treatment

IT **Membranes**
(PTFE derivs., **plasma** hydrolysis and silylation of, wettability in relation to)

IT Solvolysis
(of PTFE deriv. **membranes**, by **plasma**)

IT Silylation
(of hydrolyzed PTFE deriv. **membranes**)

IT Wettability
(of **plasma**-hydrolyzed PTFE deriv. **membranes**, **plasma** type effect on)

IT 919-30-2DP, (γ-Aminopropyl)triethoxysilane, reaction products with hydrolyzed PTFE derivs. 9002-84-0DP, Polytetrafluoroethylene, derivs., hydrolyzed, reaction products with (γ-aminopropyl)triethoxysilane
(**membranes**, prepn. of, **plasma** treatment in, **membrane** wettability in relation to)

IT 67-56-1, Methanol, reactions
(**plasma** contg. hydrogen and, PTFE deriv. **membranes** hydrolyzed by, silylation of)

IT **7732-18-5**, Water, properties
(**plasma** contg. hydrogen or oxygen and, PTFE deriv. **membranes** hydrolyzed by, wettability of)

IT **7782-44-7**, Oxygen, properties
(**plasma** contg. hydrogen or water and, PTFE deriv. **membranes** hydrolyzed by, wettability of)

IT **1333-74-0**, Hydrogen, reactions
(**plasma** contg., PTFE deriv. **membranes** hydrolyzed by, silylation of)

IT **7732-18-5**
(wettability, of **plasma**-hydrolyzed PTFE deriv. **membranes**, **plasma** type effect on)

L65 ANSWER 17 OF 19 HCA COPYRIGHT 2006 ACS on STN

110:146878 Development and application of a microwave-induced **plasma** emission spectrometric detector for gas chromatography in China. Yu, Weile (Lanzhou Inst. Chem. Phys., Acad. Sin., Lanzhou, Peop. Rep. China). Journal of Analytical Atomic Spectrometry, 3(6), 893-900 (English) **1988.** CODEN: JASPE2. ISSN: 0267-9477.

AB Two Chinese-built gas chromatog./microwave-induced **plasma** emission spectrometry (GC-MIP-ES) systems (Model SG-1) and one imported system (Model MPD-850) were used at the Lanzhou Institute of Chem. Physics, Academia Sinica (LICP), the Shanghai Institute of Org. Chem., Academia Sinica (SIOC), and the Research Institute of

the Shanghai Petroleum Refinery of the Gao Qiao Petrochem. Corporation (SPR). A diverse range of research applications (such as basic chem. reactions, industrial chem. analyses, and methodol. studies) were investigated at these three institutes. Various selected examples are cited to demonstrate the characteristics of the GC-MIP-ES system.

IT **7732-18-5**, Water, analysis
(detn. of, in Freon-12 by gas chromatog. with microwave-induced **plasma** emission spectrometric detector)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0**, Hydrogen, analysis **7553-56-2**, Iodine, analysis **7782-44-7**, Oxygen, analysis
(detn. of, in org. compds. by gas chromatog. with microwave-induced **plasma** emission spectrometric detector)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7553-56-2 HCA

CN Iodine (8CI, 9CI) (CA INDEX NAME)

I—I

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 80-2 (Organic Analytical Chemistry)
Section cross-reference(s): 79

ST gas chromatog **plasma** emission spectrometric detector; microwave induced **plasma** emission spectrometric detector; China **plasma** spectrometer gas chromatog detector

IT Chemical formula
(detn. of, by gas chromatog. with microwave-induced **plasma** emission spectrometric detector)

IT Alcohols, analysis
(detn. of, in gasoline by gas chromatog. with **plasma**

emission spectrometric detector)
IT Chromatographs, gas
(detectors, spectrometric, with microwave-induced **plasma**
)
IT 60320-18-5, Tetrachloropropene
(anal. of raw, by gas chromatog. with **plasma** emission
spectrometric detector)
IT 75-43-4, Dichlorofluoromethane 75-45-6, Chlorodifluoromethane
75-69-4, Trichlorofluoromethane 75-72-9, Chlorotrifluoromethane
124-38-9, Carbon dioxide, analysis **7732-18-5**, Water,
analysis
(detn. of, in Freon-12 by gas chromatog. with microwave-induced
plasma emission spectrometric detector)
IT 593-74-8, Dimethyl mercury 29138-86-1, Ethylmethyl mercury
(detn. of, in di-Et mercury by gas chromatog. with
microwave-induced **plasma** emission spectrometric
detector)
IT 64-17-5, Ethanol, analysis 71-36-3, 1-Butanol, analysis 75-65-0,
Tert-Butanol, analysis 78-92-2, 2-Butanol
(detn. of, in gasoline by gas chromatog. with **plasma**
emission spectrometric detector)
IT **1333-74-0**, Hydrogen, analysis 7439-97-6, Mercury, analysis
7440-44-0, Carbon, analysis **7553-56-2**, Iodine, analysis
7704-34-9, Sulfur, analysis 7723-14-0, Phosphorus, analysis
7726-95-6, Bromine, analysis 7727-37-9, Nitrogen, analysis
7782-39-0, Deuterium, analysis 7782-41-4, Fluorine, analysis
7782-44-7, Oxygen, analysis 7782-50-5, Chlorine, analysis
(detn. of, in org. compds. by gas chromatog. with
microwave-induced **plasma** emission spectrometric
detector)
IT 78-87-5, 1,2-Dichloropropane 96-18-4, 1,2,3-Trichloropropane
96-19-5 142-28-9, 1,3-Dichloropropane 1070-78-6 3175-23-3
10436-39-2, 1,1,2,3-Tetrachloro-1-propene 16500-91-7
(detn. of, in raw tetrachloropropene by gas chromatog. with
plasma emission spectrometric detector)
IT 119797-78-3
(deuterium detn. in, and theor. empirical formula calcn. for, by
gas chromatog. with **plasma** emission spectrometric
detection)
IT 67-56-1, Methanol, analysis 67-64-1, Acetone, analysis 71-43-2,
Benzene, analysis 95-47-6, analysis 95-63-6,
1,2,4-Trimethylbenzene 141-78-6, Ethyl acetate, analysis
142-82-5, Heptane, analysis 98-06-6, Tert-Butylbenzene 100-41-4,
Ethylbenzene, analysis 108-38-3, m-Xylene, analysis 108-67-8,
analysis 108-87-2, Methyl cyclohexane 108-88-3, analysis
110-82-7, Cyclohexane, analysis 111-65-9, Octane, analysis
111-84-2, Nonane 124-18-5, Decane 1120-21-4, Undecane
(identification of, in gasoline by gas chromatog. with

plasma emission spectrometric detector)

IT 82949-08-4 82949-11-9 118992-99-7
(identification of, in reaction mixts. by gas chromatog. with **plasma** emission spectrometric detector)

IT 75-71-8, Freon-12 627-44-1, Diethyl mercury
(impurity detn. in, by gas chromatog. with microwave-induced **plasma** emission spectrometric detector)

L65 ANSWER 18 OF 19 HCA COPYRIGHT 2006 ACS on STN

97:207384 Techniques for quantitation and identification of organic micropollutants by high resolution gas chromatography and element specific emission spectroscopy. Stieglitz, L.; Zwick, G. (Inst. Heisse Chem., Kernforschungszent., Karlsruhe, Fed. Rep. Ger.). Comm. Eur. Communities, [Rep.] EUR, EUR 7623, Anal. Org. Micropollut. Water, 105-12 (German) **1982.** CODEN: CECED9.

AB A combination of a gas chromatog. and a microwave-**plasma** emission detector was modified for use with high-resoln. capillary columns for detn. and identification of org. micropollutants. Eleven elements (C, H, D, N, P, O, S, F, Cl, Br, and I) can be monitored simultaneously in the gas chromatog. effluents. The relative molar response of the elements in the compds. varies only by .apprx. ±10%. The detection limits were in the range of ng/s. From the elemental ratios measured, the identification of the various compds. was possible. The technique was illustrated by identification of organohalogen compds. in water samples.

IT **1333-74-0**, analysis **7553-56-2**, analysis
7782-44-7, analysis
(detn. of, in org. compds. by capillary gas chromatog. with **plasma** emission spectrometric detection)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7553-56-2 HCA
CN Iodine (8CI, 9CI) (CA INDEX NAME)

I—I

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **7732-18-5**, analysis

(organohalogen pollutant identification in, by capillary gas chromatog. with **plasma** emission spectrometric detection)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 80-6 (Organic Analytical Chemistry)
Section cross-reference(s): 61

ST org pollutant detn chromatog spectroscopy; gas chromatog org pollutant detn; emission spectroscopy chromatog pollutant detn; **plasma** spectroscopy chromatog pollutant detn; water analysis organohalogen chromatog spectroscopy

IT Chromatography, gas
(capillary, with **plasma** emission spectrometric detection, for detn. or identification of org. pollutants)

IT Spectrochemical analysis
(emission, with **plasma** source, gas chromatog. combined with, for detn. and identification of org. pollutants)

IT Halogen compounds
(org., identification of, in **water** by capillary **gas** chromatog. with **plasma** emission spectrometric detection)

IT 87-68-3 100-68-5 108-86-1, analysis 110-02-1 118-74-1 344-03-6 352-32-9 443-26-5 462-06-6 541-73-1 544-76-3 616-44-4 705-29-3 827-08-7 1002-69-3 1146-65-2 3114-55-4 4165-57-5 4549-32-0 41051-88-1
(detn. of, by capillary gas chromatog. with **plasma** emission spectrometric detection)

IT **1333-74-0**, analysis 7440-44-0, analysis **7553-56-2**, analysis 7704-34-9, analysis 7723-14-0, analysis 7726-95-6, analysis 7727-37-9, analysis 7782-39-0, analysis 7782-41-4, analysis **7782-44-7**, analysis 7782-50-5, analysis
(detn. of, in org. compds. by capillary gas chromatog. with **plasma** emission spectrometric detection)

IT **7732-18-5**, analysis
(organohalogen pollutant identification in, by capillary gas chromatog. with **plasma** emission spectrometric detection)

L65 ANSWER 19 OF 19 HCA

83:85995 Thermodynamic properties of **plasma** forming gases.
Suris, A. L.; Aslanyan, L. S.; Shorin, S. N. (Mosk. Inst. Khim. Mashinostr., Moscow, USSR). Khimiya Vysokikh Energii, 8(5), 392-4 (Russian) **1974**. CODEN: KHVKAO. ISSN: 0023-1193.

AB Thermodn. calcns. of the equil. state of **plasma**-forming

gases H, O, N, S, F, Cl, Br, I, H2S, H2O, HCl, HF, HBr, HI, CH4,
CF4, SO2, CO2, and NH3 at 293-6000°K and 0.1-30 bar show that
CH4 and CF4 require the highest amt. of energy for **plasma**
formation. The highest sound-propagation velocity was exhibited by
H and those gases which on dissocn. form H.

IT **1333-74-0**, properties **7553-56-2**, properties
7732-18-5, vapor **7782-44-7**, properties
(**plasma**, thermal dissocn. of and sound velocity in)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7553-56-2 HCA
CN Iodine (8CI, 9CI) (CA INDEX NAME)

I—I

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 69-2 (Thermodynamics, Thermochemistry, and Thermal Properties)
Section cross-reference(s): 68, 65
ST **plasma** thermodn calcn gas; energy loss gas **plasma**
IT Thermodynamics
(of thermal **plasma** formation, in gases)
IT Dissociation
(thermal, of **plasma**-forming gases)
IT **Plasma**
(thermodn. of gases forming)
IT Sound and Ultrasound
(velocity of, in **plasma**-forming gases)
IT 74-82-8, properties 75-73-0 124-38-9, properties
1333-74-0, properties 7446-09-5, properties
7553-56-2, properties 7664-41-7, properties 7704-34-9,
properties 7726-95-6, properties 7727-37-9, properties
7732-18-5, vapor 7782-41-4, properties **7782-44-7**

, properties 7782-50-5, properties 7783-06-4, properties
(**plasma**, thermal dissocn. of and sound velocity in)
IT 7647-01-0, properties 7664-39-3, properties 10034-85-2
10035-10-6, properties
(**plasma**, thermal dissocn. of and sound velocity in
gaseous)

=> D L66 1-32 CBIB ABS HITSTR HITIND

L66 ANSWER 1 OF 32 HCA COPYRIGHT 2006 ACS on STN
140:170861 High performance tokamak experiments with a ferritic steel wall on JFT-2M. Tsuzuki, K.; Kimura, H.; Kawashima, H.; Sato, M.; Kamiya, K.; Shinohara, K.; Ogawa, H.; Hoshino, K.; Bakhtiari, M.; Kasai, S.; Uehara, K.; Sasao, H.; Kusama, Y.; Isei, N.; Miura, Y.; Ogawa, T.; Yamamoto, M.; Shibata, T.; Kikuchi, K.; Miyachi, K.; Ito, T.; Ajikawa, H.; Nomura, S.; Tsutsui, H.; Shimada, R.; Ido, T.; Hamada, Y.; Fukumoto, N.; Nagata, M.; Uyama, T.; Niimi, H.; Yatsu, S.; Kayukawa, N.; Hino, T.; Hirohata, Y.; Nagashima, Y.; Ejiri, A.; Amemiya, A.; Sadamoto, Y.; Tsushima, A. (Naka Fusion Research Establishment, Japan Atomic Energy Research Institute, Tokai-mura, 319-1195, Japan). Nuclear Fusion, 43(10), 1288-1293 (English) **2003.** CODEN: NUFUAU. ISSN: 0029-5515. Publisher: Institute of Physics Publishing.

AB Compatibility between the **plasma** and low activation ferritic steel, which is a candidate material for fusion demonstration reactors, has been investigated step by step in the JFT-2M tokamak. The authors have entered the third stage of the Advanced Material Tokamak Expt. (AMTEX), where the inside of the vacuum vessel wall is completely covered with ferritic steel plates ferritic inside wall (FIW). The effects of a FIW on the **plasma** prodn., impurity release, the operation region, and H-mode characteristics have been investigated. No neg. effect has been obsd. up to now. A high normalized beta **plasma** of βN .apprx. 3, having both an internal transport barrier and a steady H-mode edge was obtained. A remarkable redn. in ripple trapped loss from 0.26 MW m-2 (without ferritic steel) to less than 0.01 MW m-2 was demonstrated by the optimization of the thickness profile of FIW. A code to calc. fast ion losses, taking into account the full 3-dimensional magnetic structure was developed, and values obtained using the code showed good agreement with exptl. results. Thus, encouraging results are obtained for the use of this material in the DEMO-reactor.

IT **7782-44-7**, Oxygen, processes
(impurity; tokamak expts. with a ferritic steel wall on JFT-2M)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **7732-18-5**, Water, **processes**
(tokamak expts. with a ferritic steel wall on JFT-2M and assocd. cleaning issues)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0**, Hydrogen, processes
(tokamak expts. with a ferritic steel wall on JFT-2M and assocd. cleaning issues)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

CC 71-2 (Nuclear Technology)
Section cross-reference(s): 55
ST tokamak fusion **plasma** ferritic steel wall expt JFT2M; impurity ferromagnetic effect ferritic steel wall tokamak
IT **7782-44-7**, Oxygen, processes
(impurity; tokamak expts. with a ferritic steel wall on JFT-2M)
IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes **7732-18-5**, Water, **processes**
(tokamak expts. with a ferritic steel wall on JFT-2M and assocd. cleaning issues)
IT **1333-74-0**, Hydrogen, processes
(tokamak expts. with a ferritic steel wall on JFT-2M and assocd. cleaning issues)
IT 7440-59-7, Helium, uses
(tokamak expts. with a ferritic steel wall on JFT-2M and assocd. **glow discharge** cleaning)

L66 ANSWER 2 OF 32 HCA COPYRIGHT 2006 ACS on STN
139:263096 Production of hydrogen from a hydrocarbon fuel. Bowe, Michael Joseph; Hall, Stephen Ivor; Martin, Anthony Robert (Accentus PLC, UK). PCT Int. Appl. WO 2003078308 A2 **20030925**, 23 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ,

CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-GB978 20030307. PRIORITY: GB 2002-5837 20020313; GB 2002-15414 20020704.

AB Hydrogen is produced from a hydrocarbon fuel, such as diesel, by subjecting a mixt. of the fuel with oxygen gas to **plasma** treatment in a dielec. barrier **plasma** reactor to generate oxygenated mols.; mixing the resulting oxygenated mols. with **steam** and subjecting them to **steam** reforming in a compact catalytic reactor at 550-850°, and then to a **water gas** shift reaction (possibly with addnl. **steam**) at 500-700°. The source of heat for the endothermic reactions is provided by catalytic combustion in the flow channels. The resulting gases may then be mixed with a small quantity of oxygen gas, and subjected to selective oxidn. to convert any carbon monoxide to carbon dioxide. The oxygen is produced by electrolysis of water. The hydrogen is sepd. from the other products using a hydrogen-permeable **membrane.** The hydrogen may be subsequently used in a fuel cell to generate electricity. The produced CO2 is injected into porous rock formation below the sea bed. Such a process may be used at an offshore facility.

IT **1333-74-0P**, Hydrogen, uses
(prodn. of hydrogen from hydrocarbon fuel)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7732-18-5**, Water, reactions **7782-44-7**, Oxygen, reactions
(prodn. of hydrogen from hydrocarbon fuel)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM C01B003-02

CC 51-11 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 52, 67

ST hydrogen manuf purifn fuel cell power generation; **plasma** oxidn **steam** reforming **water gas** shift reaction hydrogen

IT Reactors
(**plasma**; prodn. of hydrogen from hydrocarbon fuel)

IT Diesel fuel
Electrolysis
Fuel cells
Membranes, nonbiological
Power generation
Steam reforming catalysts
Water gas shift reaction
Water gas shift reaction catalysts
(prodn. of hydrogen from hydrocarbon fuel)

IT Fuel gas manufacturing
(**steam** reforming; prodn. of hydrogen from hydrocarbon fuel)

IT **1333-74-0P**, Hydrogen, uses
(prodn. of hydrogen from hydrocarbon fuel)

IT **7732-18-5**, Water, reactions **7782-44-7**, Oxygen, reactions
(prodn. of hydrogen from hydrocarbon fuel)

L66 ANSWER 3 OF 32 HCA COPYRIGHT 2006 ACS on STN

139:189022 Post metal etch polymer removal: A new CF4-based dry **plasma** process sequence. Pozzoli, Maria Paola; Petroni, Simona (Novellus Systems, Inc., San Jose, CA, 95134, USA). Diffusion and Defect Data--Solid State Data, Pt. B: Solid State Phenomena, 92(Ultra Clean Processing of Silicon Surfaces V), 255-258 (English) **2003.** CODEN: DDBPE8. ISSN: 1012-0394. Publisher: Scitec Publications.

AB A novel CF4 based method for the dry **plasma** removal of post-metal etch polymer residues has been developed on a dual **plasma** source, dry cleaning system. This process eliminates the via damage problems obsd. when the traditional wet solvent clean process is used on specific embedded flash devices. In order to effectively clean these products, it was found that the CF4/O2/N2/H2 MW and **RF** dry **plasma** process needs to be followed by an intermediate H2O rinse (either deionized water or in-situ **H2O vapor** within the **plasma** reactor), then by a second CF4/N2H2 **RF** dry **plasma** step, and by a final H2O rinse. The intermediate H2O step appears to be crucial in making the fluorinated polymer residues more sol., before their exposure to the second F-based dry **plasma** step and their final elimination through H2O rinse. The above process provides a reliable and cost-effective alternative method to solvent-based processing, with greater cleaning efficiency, less damage to device structures and less environmental impacts.

IT **1333-74-0**, Hydrogen, processes **7782-44-7**, Oxygen, processes
(etchant; post metal etch polymer removal using CF4-based dry **plasma** process sequence)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **7732-18-5**, Water, **processes**
(rinsing; post metal etch polymer removal using CF4-based dry **plasma process** sequence)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 38
IT Etching
(**plasma**; post metal etch polymer removal using CF4-based dry **plasma** process sequence)
IT Semiconductor device fabrication
(post metal etch polymer removal using CF4-based dry **plasma** process sequence)
IT Fluoropolymers, processes
(post metal etch polymer removal using CF4-based dry **plasma** process sequence)
IT Washing
(rinsing; post metal etch polymer removal using CF4-based dry **plasma** process sequence)
IT 75-73-0, Tetrafluoromethane **1333-74-0**, Hydrogen, processes 7727-37-9, Nitrogen, processes **7782-44-7**, Oxygen, processes
(etchant; post metal etch polymer removal using CF4-based dry **plasma** process sequence)
IT 7440-21-3, Silicon, processes 7440-50-8, Copper, processes
(post metal etch polymer removal using CF4-based dry **plasma** process sequence)
IT **7732-18-5**, Water, **processes**

(rinsing; post metal etch polymer removal using CF4-based dry **plasma process** sequence)

L66 ANSWER 4 OF 32 HCA COPYRIGHT 2006 ACS on STN

136:223943 Procedure and device for the frequency-modulated excitation of hydrogen and/or a **water vapour** air mixture **plasma** with high frequency oscillations. Zembold, Otmar (Nanoplasmon Gmbh, Germany). Ger. Offen. DE 10041065 A1 **20020307**, 6 pp. (German). CODEN: GWXXBX. APPLICATION: DE 2000-10041065 20000822.

AB This high frequency oscillator produces ionized hydrogen or **water vapor.** The device consists of a specialized chamber in a suitable contg. vessel, made from dielec. material, with the gas that will be ionized. Self-induction and a condenser creates a resonant circuit in the vessel and they are arranged in a manner so that the resonance frequency F0 is in the high frequency range and that the open circuit overvoltage coeff., Q0, is defined by $Q0 = 2\pi F0L/R = 1/(2\pi F0CR)$. In this equation L = self-induction parameter, C = condenser capacity, and R = resonant circuit resistance. Since $Q0>1$, the resonance condition produces a trigger- or excitation voltage in the condenser, which lead to ionization of the gas by the electromagnetic radiation which has a frequency of $\approx$ F0. Construction details are presented.

IT **1333-74-0**, Hydrogen, processes **7732-18-5**, Water, **processes** **7782-44-7**, Oxygen, processes
(frequency-modulated ionization of hydrogen and/or **water vapor**-air **plasma** with high frequency oscillations)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM H05H001-46
ICS G01N021-71

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 65, 76

ST frequency modulated excitation hydrogen water **plasma** **microwave** oscillator resonator

IT Electric insulators
Energy level excitation
Masers
Microwave oscillators
Overvoltage
Water vapor
(frequency-modulated ionization of hydrogen and/or **water vapor**-air **plasma** with high frequency oscillations)

IT Resonators
(**microwave**; frequency-modulated ionization of hydrogen and/or **water vapor**-air **plasma** with high frequency oscillations)

IT **1333-74-0**, Hydrogen, processes **7732-18-5**, Water, **processes** **7782-44-7**, Oxygen, processes
(frequency-modulated ionization of hydrogen and/or **water vapor**-air **plasma** with high frequency oscillations)

L66 ANSWER 5 OF 32 HCA COPYRIGHT 2006 ACS on STN

136:190585 Three-dimensional analysis of combustible mixture generation in an ITER-FEAT first-wall coolant leak scenario. Baumann, W.; Breitung, W.; Kaup, B.; Necker, G.; Royl, P.; Travis, J. R. (Programm Kernfusion, Inst. Kem- Energietechnik, Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany). Wissenschaftliche Berichte - Forschungszentrum Karlsruhe, FZKA 6663, i-v, 1-37 (English) **2001.** CODEN: WBFKF5. ISSN: 0947-8620.

AB Three-dimensional distribution calcns. are performed for the ITER-FEAT vacuum vessel, the connected pressure suppression pool and drain tank. An ex-vessel/first-wall coolant leak without **plasma** shutdown is simulated. The **steam**, H, and air sources for this sequence are taken from best-est. MELCOR calcns. The time- and space-dependent gas distribution in the system is calcd. using the verified 3-dimensional Computational Fluid Dynamics code GASFLOW. A new extended version of GASFLOW was developed to model the ITER-FEAT specific phenomena in adequate detail. During the accident sequence, H initially appears only in the vacuum vessel due to the **steam**/Be reaction. After failure of the burst **membranes**, **steam** and H flow from the vacuum vessel through the connecting lines to the suppression pool and the drain tank. Because of the ongoing **steam** condensation occurring in the suppression pool, the pressure there remains permanently at a lower level compared to the

other components, resulting in a continuous flow of **steam** and noncondensable gases into this vol. Since no **steam** condensation is modeled in the drain tank, almost all H2 and N2 accumulate in the suppression pool cover gas vol. After 10,500 s of **steam** flow, also air starts entering the vacuum vessel, with the basic mechanisms remaining the same. Consequently, an accumulation of N2 and O2 takes place in the suppression pool cover gas. Combustible and explosive H2-O2-N2 mixts. exist after 13,600 s, and at 21,000 s a stoichiometric H2/O2 ratio has formed, involving 14 kg of H. Contrary to the situation in the suppression pool with its significant H risk, only inert, **steam** dominated mixts. without hazard potential develop in the vacuum vessel and the drain tank. Various passive mitigation measures could be considered to reduce or completely remove the H risk in the suppression pool.

IT **1333-74-0**, Hydrogen, formation (nonpreparative)
7782-44-7, Oxygen, formation (nonpreparative)
(combustible and explosive H2-O2-N2 mixts. exist)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 71-2 (Nuclear Technology)
IT **Steam**
(continuous flow of **steam** and noncondensable gases in suppression pool happens)
IT **1333-74-0**, Hydrogen, formation (nonpreparative) 7727-37-9, Nitrogen, formation (nonpreparative) **7782-44-7**, Oxygen, formation (nonpreparative)
(combustible and explosive H2-O2-N2 mixts. exist)
IT 7440-41-7, Beryllium, reactions
(hydrogen initially appears during accident in vacuum vessel due to **steam**/beryllium reaction.)

L66 ANSWER 6 OF 32 HCA COPYRIGHT 2006 ACS on STN
136:160223 Magnetic recording medium and method for producing and inspecting the deposition characteristics in its fabrication. Kato, Junya; Suzuki, Mikio (Showa Denko K.K., Japan). PCT Int. Appl. WO 2002011130 A1 **20020207**, 93 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR,

CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-JP6580 20010731. PRIORITY: JP 2000-231114 20000731; US 2000-246595P 20001108.

AB The present invention provides a method for inspecting deposition characteristics of a deposition on the surface of a protective film predominantly contg. C of a magnetic recording medium, which medium includes a disk and the protective film formed on the disk, the disk including a nonmagnetic substrate, a nonmagnetic undercoat layer, and a magnetic layer, the layers being formed on the substrate, wherein the method includes comparing a predetd. threshold with the extn. amt. of an inspection gas component and/or a compd. component formed so as to contain the inspection gas component, the gas component and/or the compd. component being extd. with an inspection solvent after the magnetic recording medium is allowed to stand in an atm. of the inspection gas component; a process for producing a magnetic recording medium in which the extn. amt. is or greater than the threshold, the extn. amt. being obtained through the inspection method; and a magnetic recording medium produced through the prodn. process.

IT **1333-74-0**, Hydrogen, uses
(amorphous carbon dopant; magnetic recording medium and method for producing and inspecting deposition characteristics in fabrication)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7732-18-5**, Water, **processes**
(inspection solvent; magnetic recording medium and method for producing and inspecting deposition characteristics in fabrication)

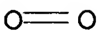
RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **7782-44-7**, Oxygen, processes
(magnetic recording medium and method for producing and inspecting deposition characteristics in fabrication)

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)



IC ICM G11B005-72
ICS G11B005-84
CC 77-8 (Magnetic Phenomena)
IT Vapor deposition process
(**plasma**; magnetic recording medium and method for producing and inspecting deposition characteristics in fabrication)
IT Sputtering
(**radio-frequency**; magnetic recording medium and method for producing and inspecting deposition characteristics in fabrication)
IT **1333-74-0**, Hydrogen, uses
(amorphous carbon dopant; magnetic recording medium and method for producing and inspecting deposition characteristics in fabrication)
IT 64-17-5, Ethanol, processes 67-56-1, Methanol, processes 67-63-0, Isopropanol, processes **7732-18-5**, Water, **processes**
(inspection solvent; magnetic recording medium and method for producing and inspecting deposition characteristics in fabrication)
IT 7440-37-1, Argon, processes 7727-37-9, Nitrogen, processes **7782-44-7**, Oxygen, processes 99752-23-5, Z-DOL 2000
(magnetic recording medium and method for producing and inspecting deposition characteristics in fabrication)

L66 ANSWER 7 OF 32 HCA COPYRIGHT 2006 ACS on STN
135:362523 Method for production of enhanced traceable immunizing drinking water and other liquid and gas products, devices for production and use thereof, and use of the enhanced products for immunizing living beings. Tribelsky, Zamir; Ende, Michael (Atlantium Ltd., Israel). PCT Int. Appl. WO 2001083385 A2 **20011108**, 139 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-IL383 20010427. PRIORITY: IL 2000-135843 20000428.

AB A method for the prodn. of enhanced traceable optp-physiol. polished liqs., and gases or solids or combination for immunizing living beings, devices using the method, use, and preferred mode for utilization are disclosed. A multi processing platform is proposed according to the invention harnessing time domain optronics of light and sound, wherein the transient sound produced by light is measured, referenced or calibrated against the light produced by sound for the formation adequate energy levels or densities or fluence rates for the purpose of dissocn. of noxious or innocuous species or combination constituents components while keeping their geometrical integrity above their predetd. resonance levels, thus intact for later traceable recognition and triggering of pos. decisive action by immune systems.

IT **7782-44-7**, Oxygen, biological studies
(dissolved; prodn. of biol. enhanced traceable drinking water and other liq. and gas products for immunizing living beings)

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

$O=O$

IT **7732-18-5**, Water, reactions
(oxidn., supercrit.; prodn. of biol. enhanced traceable drinking water and other liq. and gas products for immunizing living beings)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0**, Hydrogen, biological studies
(prodn. of biol. enhanced traceable drinking water and other liq. and gas products for immunizing living beings)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

$H-H$

IC ICM C02F009-00
ICS B01D053-00

CC 63-3 (Pharmaceuticals)
Section cross-reference(s): 15, 16, 17, 18, 47, 61

IT Cell **membrane**
(components; prodn. of biol. enhanced traceable drinking water and other liq. and gas products for immunizing living beings)

IT **Plasma**
(non-thermal; prodn. of biol. enhanced traceable drinking water and other liq. and gas products for immunizing living beings)
IT Lymphocyte
(**plasma** cell; prodn. of biol. enhanced traceable drinking water and other liq. and gas products for immunizing living beings)
IT **7782-44-7**, Oxygen, biological studies
(dissolved; prodn. of biol. enhanced traceable drinking water and other liq. and gas products for immunizing living beings)
IT **7732-18-5**, Water, reactions
(oxidn., supercrit.; prodn. of biol. enhanced traceable drinking water and other liq. and gas products for immunizing living beings)
IT **1333-74-0**, Hydrogen, biological studies
(prodn. of biol. enhanced traceable drinking water and other liq. and gas products for immunizing living beings)

L66 ANSWER 8 OF 32 HCA COPYRIGHT 2006 ACS on STN
135:275384 Mixed reactant fuel cells with flow through porous electrodes. Priestnall, Michael Alexander; Evans, Michael Joseph; Shaffer, Milo Sebastian Peter (Scientific Generics Limited, UK). PCT Int. Appl. WO 2001073881 A1 **20011004**, 68 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-GB1339 20010326. PRIORITY: GB 2000-7306 20000324; GB 2000-19622 20000809; GB 2000-19623 20000809; GB 2000-25030 20001012; GB 2000-26935 20001103; GB 2000-27587 20001110.
AB A fuel cell or battery for providing useful elec. power by electrochem. means, comprises: at least one cell; at least one anode and at least one cathode within the cell, and ion-conducting electrolyte means for transporting ions between the electrodes; and is characterized in that: the electrodes are porous and in that means are provided for causing hydrodynamic flow of a mixt. of at least fuel and oxidant through the body of the electrodes.
IT **7732-18-5**, water, uses
(mixed reactant fuel cells with flow through porous electrodes)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **7782-44-7**, Oxygen, reactions
(mixed reactant fuel cells with flow through porous electrodes)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **1333-74-0**, Hydrogen, uses
(mixed reactant fuel cells with flow through porous electrodes)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

IC ICM H01M008-10
ICS H01M008-08; H01M008-22
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Air
Battery electrodes
Fuel cell electrodes
Fuel cells
Plasma
Secondary batteries
Turbulence
(mixed reactant fuel cells with flow through porous electrodes)
IT **Membranes**, nonbiological
(polymer; mixed reactant fuel cells with flow through porous electrodes)
IT 1310-58-3, potassium hydroxide, uses **7732-18-5**, water, uses 7783-96-2, Silver iodide 55575-02-5, Cerium gadolinium oxide 64417-98-7, Yttrium zirconium oxide 65453-23-8, Cerium zirconium oxide 65983-06-4, Iridium zirconium oxide
(mixed reactant fuel cells with flow through porous electrodes)
IT 7722-84-1, Hydrogen peroxide, reactions **7782-44-7**, Oxygen, reactions
(mixed reactant fuel cells with flow through porous electrodes)
IT 67-56-1, Methanol, uses **1333-74-0**, Hydrogen, uses 7440-44-0, Carbon, uses
(mixed reactant fuel cells with flow through porous electrodes)

L66 ANSWER 9 OF 32 HCA
135:36421 Decomposition of CH3SH in an **RF Plasma**

Reactor: Reaction Products and Mechanisms. Tsai, Cheng-Hsien; Lee, Wen-Jhy; Chen, Chuh-Yung; Liao, Wei-Tung (Departments of Environmental Engineering and Chemical Engineering, National Cheng Kung University, Tainan, 70101, Taiwan). Industrial & Engineering Chemistry Research, 40(11), 2384-2395 (English) **2001.** CODEN: IECRED. ISSN: 0888-5885. Publisher: American Chemical Society.

AB Application of the **RF (radio frequency**
) cold **plasma** method to the decompn. of methanethiol (Me mercaptan, CH3SH) at different O2/CH3SH ratios (0-4.5), with various input powers (20-90 W), and at const. operating pressure (30 Torr) was investigated. The species detected in the CH3SH/O2/Ar **RF plasma** were SO2, CS2, OCS, CO, CO2, CH4, C2H4 C2H2, H2, H2O, HCOH, and CH3OH. However, CS2, CH4, C2H4, C2H2, H2, H2S, CH3SCH3 (DMS), and CH3S2CH3 (DMDS) were detected in the CH3SH/Ar **RF plasma.** In the CH3SH/Ar **plasma**, over 83.7% of the total sulfur input was converted into CS2 at 60 W; this is due to the lack of competition between O and S and the thermodn. stability of CS2. In the oxygen-rich conditions of the CH3SH/O2/Ar **plasma**, the most predominant sulfur-contg. compd. was SO2. As the feed O2/CH3SH ratio was increased, MSO2 was increased, while MCS2 was decreased simultaneously. MOCS was reduced by increasing either the O2/CH3SH ratio or the applied power. From the decay of CS2 and the generation of CO at a lower O2/CH3SH ratio of 0.6, CS, CS2, and CO were suggested as the primary species to react with O, OH, O2, S, or S2 and then to form OCS. This study provides useful insight into the reaction mechanisms involved in the decompn. of CH3SH and, mainly, the formation of CS2, CH4, C2H2, C2H4, SO2, CO, CO2, and OCS in CH3SH/Ar and CH3SH/O2/Ar plasmas.

IT **7732-18-5**, Water, **processes**
(reaction product of decompn. of CH3SH in CH3SH/O2/Ar mixt. in **radio frequency plasma** reactor)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

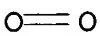
IT **1333-74-0**, Hydrogen, processes
(reaction product of decompn. of CH3SH in both CH3SH/O2/Ar and CH3SH/Ar mixts. in **radio frequency plasma** reactor)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7782-44-7**, Oxygen, reactions
(reaction products and mechanisms of decompn. of CH3SH in
radio frequency plasma reactor)
RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)



CC 59-2 (Air Pollution and Industrial Hygiene)
ST mechanism decompn methanethiol **radio frequency**
plasma; odor control mechanism decompn methanethiol
radio frequency plasma
IT Air pollution
(control, odor; reaction products and mechanisms of decompn. of
CH3SH in **radio frequency plasma**
reactor and implications for odor control)
IT Cold **plasma**
Decomposition kinetics
Reaction mechanism
(reaction products and mechanisms of decompn. of CH3SH in
radio frequency plasma reactor)
IT 7440-37-1, Argon, miscellaneous
(inert gas used to study reaction products and mechanisms of
decompn. of CH3SH in **radio frequency**
plasma reactor)
IT 75-18-3, Dimethylsulfide 624-92-0, Dimethyldisulfide 7783-06-4,
Hydrogen sulfide, processes
(reaction product of decompn. of CH3SH in CH3SH/Ar mixt. in
radio frequency plasma reactor)
IT 50-00-0, Formaldehyde, processes 67-56-1, Methanol, processes
124-38-9, Carbon dioxide, processes 463-58-1, Carbon oxide sulfide
630-08-0, Carbon monoxide, processes 7446-09-5, Sulfur dioxide,
processes **7732-18-5**, Water, **processes**
(reaction product of decompn. of CH3SH in CH3SH/O2/Ar mixt. in
radio frequency plasma reactor)
IT 74-82-8, Methane, processes 74-85-1, Ethene, processes 74-86-2,
Ethyne, processes 75-15-0, Carbon disulfide, processes
1333-74-0, Hydrogen, processes
(reaction product of decompn. of CH3SH in both CH3SH/O2/Ar and
CH3SH/Ar mixts. in **radio frequency**
plasma reactor)
IT 74-93-1, Methanethiol, processes
(reaction products and mechanisms of decompn. of CH3SH in an
RF plasma reactor)
IT **7782-44-7**, Oxygen, reactions
(reaction products and mechanisms of decompn. of CH3SH in

radio frequency plasma reactor)

L66 ANSWER 10 OF 32 HCA COPYRIGHT 2006 ACS on STN
135:11229 Removal of particles by ICRF cleaning in HT-7 superconducting tokamak. Hu, Jian-sheng; Li, Jian-gang; Zhang, Shou-yin; Gu, Xue-mao; Zhang, Xiao-dong; Zhao, Yan-pin; Gong, Xian-zu; Kuang, Guang-li; Li, Cheng-fu; Luo, Jia-rong; Wang, Xiao-ming; Gao, Xiang; Wan, Bao-nian; Xie, Ji-kang; Wan, Yuan-xi (Institute of Plasma Physics, The Chinese Academy of Sciences, Hefei, 230031, Peop. Rep. China). Plasma Science & Technology (Hefei, China), 3(1), 621-627 (English) **2001.** CODEN: PSTHC3. ISSN: 1009-0630. Publisher: Chinese Academy of Sciences, Institute of Plasma Physics.

AB The ICRF (Ion Cyclotron Range Frequency) cleaning technique has been used as a routine wall cleaning method in the HT-7 superconducting tokamak. In a wide range of toroidal fields, the removal rate of residual gas by ICRF cleaning was about 20-fold higher than that of **glow discharge** cleaning (GDC). At different gas pressures and **RF** power levels, the ICRF cleaning is studied carefully. A good impurity cleaning effect and a very high hydrogen removal rate were obtained. The removal rate of hydrogen by 5 kW ICRF cleaning achieved was 1.6 + 10-5 torr L/s. Relations among pressure, outgassing rate, at. layers absorbed on surface and the cleaning mode are discussed.

IT **1333-74-0**, Hydrogen, processes **7732-18-5**, Water, **processes** **7782-44-7**, Oxygen, processes
(particle removal by ICRF cleaning in the HT-7 superconducting tokamak)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 71-2 (Nuclear Technology)
ST tokamak ICRF cleaning particle removal HT7; fusion **plasma** ICRF cleaning particle removal HT7

IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes **1333-74-0**, Hydrogen, processes **7732-18-5**
, Water, **processes 7782-44-7**, Oxygen, processes
12385-15-8, carbide
(particle removal by ICRF cleaning in the HT-7 superconducting tokamak)

L66 ANSWER 11 OF 32 HCA COPYRIGHT 2006 ACS on STN
134:358568 Conditionings for **plasma** facing walls of large helical device. Hino, T.; Ohuchi, T.; Hashiba, M.; Yamauchi, Y.; Hirohata, Y.; Inoue, N.; Sagara, A.; Noda, N.; Motojima, O. (Department of Nuclear Engineering, Hokkaido University, Sapporo, 060-8628, Japan). Journal of Nuclear Materials, 290-293, 1176-1179 (English) **2001.** CODEN: JNUMAM. ISSN: 0022-3115. Publisher: Elsevier Science B.V..
AB The first and second exptl. campaigns in large helical device (LHD) were carried out from Mar. to Dec. 1998. Before the each campaign, the material probes were placed at the inner wall of vacuum vessel along the poloidal direction. After each campaign, change of surface morphol., impurity depth profile and gas desorption of the samples were examd. In the first exptl. campaign, the ECR discharge cleanings were employed. After the first exptl. campaign, the surface was modified by the deposition of sub-micron particles, and the concns. such as oxygen and carbon were still high. Impurity gas desorption was also large in the sample at the port. In the second exptl. campaign, the **glow discharge** cleanings were employed and the no. of main discharge shots increased. After the second exptl. campaign, no significant deposition took place except for the position close to the divertor leg, and the oxygen impurity level was reduced. In every sample, the helium was retained by the helium **glow discharge.** In addn., the amt. of gas desorption was considerably reduced even in the sample at the port. In the second exptl. campaign, the wall conditionings largely progressed by using the **glow discharge** cleanings and the increase of main discharge shots with a high heating power.
IT **1333-74-0**, Hydrogen, processes **7732-18-5**, Water, **processes 7782-44-7**, Oxygen, processes
(conditionings for **plasma** facing walls of large helical device)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 71-2 (Nuclear Technology)
Section cross-reference(s): 55
IT Desorption
Electron cyclotron resonance
Erosion (wear)
Fusion reactor divertors
Fusion reactor plasmas
Impurities
(conditionings for **plasma** facing walls of large helical device)
IT Fusion reactors
(heliotron; conditionings for **plasma** facing walls of large helical device)
IT 11134-23-9
(conditionings for **plasma** facing walls of large helical device)
IT 74-82-8, Methane, processes 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes **1333-74-0**, Hydrogen, processes 7440-59-7, Helium, processes **7732-18-5**, Water, **processes 7782-44-7**, Oxygen, processes
(conditionings for **plasma** facing walls of large helical device)

L66 ANSWER 12 OF 32 HCA COPYRIGHT 2006 ACS on STN
134:74032 Polymer electrolyte **membrane** with integrated **plasma**-polymerized ion-conducting barrier layer. Mueller, Joerg; Guth, Thomas; Mex, Laurent (Germany). Ger. Offen. DE 19914571 A1 **20010104**, 4 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1999-19914571 19990331.
AB The permeability of fuel cells with polymer electrolyte **membranes** to fuels (esp. methanol), is diminished sharply (vs. the state of the art) by coating the **membrane** surfaces with highly crosslinked **plasma**-polymd. ion-conducting layers.
IT **7732-18-5**, Water, processes
(polymer electrolyte **membrane** with integrated **plasma**-polymd. ion-conducting barrier layer)
RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0**, Hydrogen, uses **7782-44-7**, Oxygen, uses
(polymer electrolyte **membrane** with integrated **plasma**-polymd. ion-conducting barrier layer)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM H01M008-02
ICS H01M008-10; C08F002-46
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST fuel cell polymer **membrane** fuel permeability decrease
IT Polymerization
(**plasma**; polymer electrolyte **membrane** with integrated **plasma**-polymd. ion-conducting barrier layer)
IT Fuel cells
Permeability
Polymer electrolytes
(polymer electrolyte **membrane** with integrated **plasma**-polymd. ion-conducting barrier layer)
IT 630-08-0, Carbon monoxide, processes **7732-18-5**, Water, processes
(polymer electrolyte **membrane** with integrated **plasma**-polymd. ion-conducting barrier layer)
IT 67-56-1, Methanol, uses **1333-74-0**, Hydrogen, uses **7782-44-7**, Oxygen, uses
(polymer electrolyte **membrane** with integrated **plasma**-polymd. ion-conducting barrier layer)

L66 ANSWER 13 OF 32 HCA COPYRIGHT 2006 ACS on STN
133:307286 Biosensor using **plasma**-polymerized **membrane**
. Muguruma, Hitoshi; Hiratsuka, Akinori; Karube, Masao (Sentan Kagaku Gijutsu Incubation Center K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2000298111 A2 **20001024**, 11 pp. (Japanese).
CODEN: JKXXAF. APPLICATION: JP 1999-107691 19990415.

AB A highly functional biosensor with a novel structure is conveniently constructed using a **plasma**-polymd. **membrane.** The biosensor is constituted with a **plasma**-polymd. **membrane** contg. functional groups, a catalytically active substance (e.g., enzyme) immobilized on the **plasma**-polymd. **membrane** using a crosslinking reagent, and a metal electrode pattern in contact with a sample through the **plasma** -polymd. **membrane.** The influence by interfering compds. is eliminated due to the hydrogen peroxide-selective permeability of the **membrane.** The sensor can be applied in a wide range of areas in combination with micromachine technique. A diagram describing the sensor assembly is given.

IT **1333-74-0**, Hydrogen, uses **7732-18-5**, Water, uses **7782-44-7**, Oxygen, uses
(biosensor using **plasma**-polymd. **membrane**)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IC ICM G01N027-327
CC 9-1 (Biochemical Methods)
ST biosensor **plasma** polymn **membrane** enzyme electrode
IT Amide group
Amino group
Carbonyl group
Carboxyl group
Crosslinking agents
Enzyme electrodes
Epoxy group
Formyl group
Functional groups
Glucose sensors
Hydroxyl group

Immobilization, biochemical
  Membrane electrodes
  Membranes, nonbiological
Micromachines
Permeability
Sulfhydryl group
    (biosensor using **plasma**-polymd. **membrane**)
IT Enzymes, uses
    (biosensor using **plasma**-polymd. **membrane**)
IT Metals, uses
    (biosensor using **plasma**-polymd. **membrane**)
IT Halogens
    (biosensor using **plasma**-polymd. **membrane**)
IT Monomers
    (biosensor using **plasma**-polymd. **membrane**)
IT Noble gases, uses
    (biosensor using **plasma**-polymd. **membrane**)
IT Sensors
    (electrochem.; biosensor using **plasma**-polymd.
    membrane)
IT Functional groups
    (imino group; biosensor using **plasma**-polymd.
    membrane)
IT Functional groups
    (isocyanato group; biosensor using **plasma**-polymd.
    membrane)
IT Polymerization
    (**plasma**; biosensor using **plasma**-polymd.
    membrane)
IT Functional groups
    (vinyl group; biosensor using **plasma**-polymd.
    membrane)
IT 7722-84-1, Hydrogen peroxide, analysis
    (biosensor using **plasma**-polymd. **membrane**)
IT 9000-88-8, D-Amino acid oxidase 9000-89-9, L-Amino acid oxidase
9001-37-0, Glucose oxidase 9001-46-1, Glutamate dehydrogenase
9001-96-1, Pyruvate oxidase 9028-14-2, Glycerol dehydrogenase
9028-53-9, Glucose dehydrogenase 9028-67-5, Choline oxidase
9028-76-6, Cholesterol oxidase 9028-79-9, Galactose oxidase
9028-86-8, Aldehyde dehydrogenase 9031-72-5, Alcohol dehydrogenase
9035-73-8, Oxidase 9035-82-9, Dehydrogenase 9059-11-4, Amine
oxidase 67775-34-2, Cholesterol dehydrogenase 135622-84-3,
Fructose dehydrogenase 220983-94-8, Sorbitol dehydrogenase
    (biosensor using **plasma**-polymd. **membrane**)
IT 50-81-7, Ascorbic acid, analysis 51-61-6, Dopamine, analysis
57-13-6, Urea, analysis 103-90-2
    (biosensor using **plasma**-polymd. **membrane**)
IT 7440-06-4, Platinum, uses

(biosensor using **plasma**-polymd. **membrane**)
IT 302-01-2, Hydrazine, uses **1333-74-0**, Hydrogen, uses
7664-41-7, Ammonia, uses 7727-37-9, Nitrogen, uses
7732-18-5, Water, uses **7782-44-7**, Oxygen, uses
7783-06-4, Hydrogen sulfide, uses 13465-07-1, Hydrogen disulfide
(biosensor using **plasma**-polymd. **membrane**)
IT 75-05-8, Acetonitrile, reactions 107-46-0, Hexamethyldisiloxane
111-30-8, Glutaraldehyde
(biosensor using **plasma**-polymd. **membrane**)

L66 ANSWER 14 OF 32 HCA COPYRIGHT 2006 ACS on STN
132:209793 Heat treatment of solid carbonaceous material in **plasma** reactors. Swanepoel, Jacobus; Lombaard, Ruan; Mast-Ingle, Julian Charles (S. Afr.). PCT Int. Appl. WO 2000013785 A1 **20000316**, 34 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1999-IB1477 19990826. PRIORITY: ZA 1998-8028 19980902.
AB An **elec. arc plasma** reactor is used for treating solid carbonaceous material by heating the material to ≥1800°C using a non-transfer arc generated **plasma** flame. Components in the carbonaceous material are gasified and removed from the residual solid material as a hot gas, where the residual solid material may be recovered as a product. A vertical shaft non-transfer arc **plasma** reactor is used which comprises an upper preheating zone, an intermediate reaction zone in which ≥1 non-transfer arc **plasma** generator or reactor is located, and a lower cooling zone.
IT **1333-74-0**, Hydrogen, processes **7782-44-7**, Oxygen, processes
(heat treatment of solid carbonaceous material in **plasma** reactors)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **7732-18-5, Water, processes**
(**vapor**; heat treatment of solid carbonaceous material in **plasma** reactors)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IC ICM B01J019-08
ICS B01J008-18; B01J008-12; B01J008-08; C10B019-00; C10J003-18
CC 48-8 (Unit Operations and Processes)
Section cross-reference(s): 49, 55, 56, 57, 76
ST carbonaceous material heat treatment **plasma** reactor
IT Carburizing
Ceramics
Graphitization
Heat treatment
Linings (refractory)
Reduction
Thermal decomposition
(heat treatment of solid carbonaceous material in **plasma** reactors)
IT Carbides
Metals, processes
(heat treatment of solid carbonaceous material in **plasma** reactors)
IT Carbonaceous materials (technological products)
(heat treatment of solid carbonaceous material in **plasma** reactors)
IT Coke
(low-sulfur, low-ash; heat treatment of solid carbonaceous material in **plasma** reactors)
IT Coke
(pitch; heat treatment of solid carbonaceous material in **plasma** reactors)
IT Reactors
(**plasma**; heat treatment of solid carbonaceous material in **plasma** reactors)
IT 7440-44-0P, Carbon, processes 7782-42-5P, Graphite, processes
(heat treatment of solid carbonaceous material in **plasma** reactors)
IT 1314-23-4, Zirconia, uses 7439-98-7, Molybdenum, uses 7440-33-7, Tungsten, uses

(heat treatment of solid carbonaceous material in **plasma** reactors)

IT 74-90-8P, Hydrogen cyanide, processes 75-73-0P, Carbon tetrafluoride 76-16-4P 116-14-3P, Tetrafluoroethylene, processes 116-15-4P, Hexafluoropropylene 409-21-2P, Silicon carbide, processes 11114-46-8P, Ferrochromium
(heat treatment of solid carbonaceous material in **plasma** reactors)

IT 630-08-0, Carbon monoxide, processes **1333-74-0**, Hydrogen, processes 7440-01-9, Neon, processes 7440-37-1, Argon, processes 7440-59-7, Helium, processes 7631-86-9, Silica, processes 7727-37-9, Nitrogen, processes 7782-41-4, Fluorine, processes **7782-44-7**, Oxygen, processes 7782-50-5, Chlorine, processes 12068-77-8, Iron chromite ($FeCr_2O_4$)
(heat treatment of solid carbonaceous material in **plasma** reactors)

IT **7732-18-5, Water, processes**
(**vapor**; heat treatment of solid carbonaceous material in **plasma** reactors)

L66 ANSWER 15 OF 32 HCA COPYRIGHT 2006 ACS on STN

131:345219 Applications of the cavity ring-down technique to a large-area **rf-plasma** reactor. Grangeon, F.; Monard, C.; Dorier, J.-L.; Howling, A. A.; Hollenstein, Ch.; Romanini, D.; Sadeghi, N. (Ecole Polytechnique Federale de Lausanne, Centre de Recherches en Physique des Plasmas, Lausanne, 1015, Switz.). Plasma Sources Science & Technology, 8(3), 448-456 (English) **1999.** CODEN: PSTEEU. ISSN: 0963-0252. Publisher: Institute of Physics Publishing.

AB The cavity ring-down technique is applied to an industrial-scale **radiofrequency (rf) plasma** reactor for the measurement of the d. and spatial profile of neg. ions in pure O and H **radiofrequency** plasmas, and for the detection of nanometric particles in Ar-silane plasmas. The real-time observation of powder formation is feasible by the cavity ring-down technique. An obsd. **plasma**-induced spurious drift of the ring-down time is also studied and related to H_2O desorption from the reactor walls and electrodes which is re-adsorbed on the mirror surfaces.

IT **1333-74-0**, Hydrogen, properties **7782-44-7**, Oxygen, properties
(applications of cavity ring-down technique to large-area **RF-plasma** reactor for measurement of anion d.)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **7732-18-5**, Water, **processes**
(desorption; applications of cavity ring-down technique to large-area **RF-plasma** reactor with)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 76-11 (Electric Phenomena)
ST cavity ring **plasma** reactor; anion formation **plasma** reactor oxygen hydrogen; silane argon **plasma** reactor anion
IT Mirrors
(applications of cavity ring-down technique to large-area **RF-plasma** reactor)
IT Anions
Electric discharge devices
(applications of cavity ring-down technique to large-area **RF-plasma** reactor for measurement of anion d.)
IT Nanoparticles
(applications of cavity ring-down technique to large-area **RF-plasma** reactor for measurement of anion d. and)
IT Powders
(applications of cavity ring-down technique to large-area **RF-plasma** reactor in deposition of)
IT Degassing
(applications of cavity ring-down technique to large-area **RF-plasma** reactor with)
IT Photoionization
(in applications of cavity ring-down technique to large-area **RF-plasma** reactor)
IT Electrodes
(**plasma**; applications of cavity ring-down technique to large-area **RF-plasma** reactor)
IT Reactors
(**plasma**; applications of cavity ring-down technique to large-area **RF-plasma** reactor for measurement of anion d.)
IT 12184-88-2, Hydride 14337-01-0, Oxygen(1-), properties
(applications of cavity ring-down technique to large-area

RF-plasma reactor for measurement of anion d.)
IT 7440-37-1, Argon, processes 7803-62-5, Silane, processes
(applications of cavity ring-down technique to large-area **RF-plasma** reactor for measurement of anion d.)
IT **1333-74-0**, Hydrogen, properties **7782-44-7**, Oxygen, properties
(applications of cavity ring-down technique to large-area **RF-plasma** reactor for measurement of anion d.)
IT **7732-18-5**, Water, **processes**
(desorption; applications of cavity ring-down technique to large-area **RF-plasma** reactor with)

L66 ANSWER 16 OF 32 HCA COPYRIGHT 2006 ACS on STN
131:93862 Boron-doped CVD diamond as an electrode material for cyclic voltammetry in various electrolyte solutions for electroanalytical applications. Ramesham, R.; Rose, M. F. (Space Power Institute, Auburn University, Auburn, AL, 36849-5320, USA). High Temperature and Materials Science, Volume Date 1997, 38(1), 1-12 (English) **1999.** CODEN: HTMSFP. ISSN: 1080-1278. Publisher: Humana Press Inc..
AB Boron-doped polycryst. diamond films were grown over a molybdenum substrate by a **microwave plasma** CVD process using a methane and hydrogen gas mixt. at a pressure of 35.7 torr. Boron doping of diamond was achieved in situ by using a solid boron source while growing diamond in the CVD process. Cyclic voltammetry was used to evaluate the boron-doped diamond-coated molybdenum electrode material in 0.5M NaCl, 0.5M HNO3, 0.5M HCl, 0.5M KOH, 1M KNO3, and 1M Na2SO4 solns. The authors obsd. a negligible background current for diamond by cyclic voltammetry in the various solns. over a wide potential range. Therefore, diamond will certainly have a use as an electrode material in electroanal. applications. The authors have studied the redox kinetic behavior of Fe(CN)63- + e- <=> Fe(CN)64- at the boron-doped diamond electrode in 1M KNO3 supporting electrolyte soln. and cor. the voltammetric response for IR compensation. The heterogeneous electron transfer rate const. was detd. using the exptl. data and COOL algorithm. The rate const. is approx. 2 + 10-4 cm/s, and the kinetics were considered to be sluggish at the diamond electrode/soln. interface.
IT **7732-18-5**, Water, **processes**
(electrolysis; on boron-doped diamond electrode)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0**, Hydrogen, properties **7782-44-7**, Oxygen, properties

(evolution on boron-doped diamond electrode in aq. solns.)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 72-2 (Electrochemistry)
Section cross-reference(s): 67, 75, 79

IT Vapor deposition process
(**plasma**; of boron-doped diamond for electrode)

IT **7732-18-5**, Water, **processes**
(electrolysis; on boron-doped diamond electrode)

IT **1333-74-0**, Hydrogen, properties **7782-44-7**, Oxygen, properties
(evolution on boron-doped diamond electrode in aq. solns.)

IT 74-82-8, Methane, reactions
(in **microwave plasma** CVD of boron-doped diamond for electrode)

L66 ANSWER 17 OF 32 HCA

131:89695 Process and system for separation and recovery of perfluorocompound gases. Li, Yao-En; Paganessi, Joseph E.; Vassallo, David; Fleming, Gregory K. (L'Air liquide S. A, Fr.). PCT Int. Appl. WO 9936159 A1 **19990722**, 105 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1998-EP2272 19980416. PRIORITY: JP 1998-7021 19980116.

AB Processes and systems to recover at least one perfluorocompound gas from a gas mixt. are provided. In one embodiment the inventive process comprises providing a gas mixt. comprising at least one perfluorocompound gas and at least one carrier gas, the gas mixt. being at a predetd. pressure; providing at least one size selective **membrane** having a feed side and a permeate side; contacting the feed side of the at least one **membrane** with the gas mixt.; withdrawing from the feed side of the **membrane** as a

non-permeate stream at a pressure which is substantially equal to the predetd. pressure a concd. gas mixt. comprising essentially the at least one perfluorocompound gas; and withdrawing from the permeate side of the **membrane** as a permeate stream a depleted gas mixt. comprising essentially the at least one carrier gas.

IT **1333-74-0**, Hydrogen, uses **7732-18-5**, Water, uses **7782-44-7**, Oxygen, uses
(process and system for sepn. and recovery of perfluorocompound gases)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM B01D053-22
CC 48-1 (Unit Operations and Processes)
Section cross-reference(s): 59, 76
IT Air purification
(**membrane** sepn.; process and system for sepn. and recovery of perfluorocompound gases)
IT Decomposition
(**plasma**; process and system for sepn. and recovery of perfluorocompound gases)
IT Adsorption
Gases
Heat exchangers
Membranes, nonbiological
Scrubbers
Scrubbing
Semiconductor device fabrication
Separation
Thermal decomposition
(process and system for sepn. and recovery of perfluorocompound gases)

IT 124-38-9, Carbon dioxide, uses 630-08-0, Carbon monoxide, uses **1333-74-0**, Hydrogen, uses 7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7440-63-3, Xenon, uses 7727-37-9, Nitrogen, uses **7732-18-5**, Water, uses **7782-44-7**, Oxygen, uses
(process and system for sepn. and recovery of perfluorocompound gases)

L66 ANSWER 18 OF 32 HCA COPYRIGHT 2006 ACS on STN
130:30543 Preliminary study of ferri-ferrocyanide redox kinetics at the submillimeter boron-doped CVD diamond electrode. Ramesham, Rajeshuni (Space Power Institute, 231 Leach Center, Auburn University, Auburn, AL, 36849-5320, USA). Sensors and Materials, 10(5), 275-286 (English) **1998.** CODEN: SENMER. ISSN: 0914-4935. Publisher: Scientific Publishing Division of MYU K.K..

AB Boron-doped CVD diamond was grown on mech. damaged and cleaned molybdenum substrate using the **microwave plasma** CVD process. The gases used to grow the CVD diamond were methane and hydrogen. Boron doping of the diamond was achieved in situ using a solid disk source of B2O3. The submillimeter boron-doped CVD diamond electrode was evaluated for background current response in 0.5M NaCl by cyclic voltammetry. Photolithog. was used to pattern the CVD diamond to fabricate a submillimeter electrode for cyclic voltammetry studies. Preliminary results on the voltammetric response of the fabricated (0.003 cm2) CVD diamond electrode are reported. The authors obsd. negligible background current for submillimeter boron-doped CVD diamond electrode over a wide potential range. Decompn. of water occurs electrochem., evolving O2 during pos. (anodic) polarization and H2 during neg. (cathodic) polarization. SEM was used to study the morphol. of the diamond electrode before and after electrochem. characterization; the authors conclude qual. that the morphol. was unchanged. The authors have studied the redox kinetics of ferri-ferrocyanide (Fe(CN)63- + e- .dblarw. Fe(CN)64-) in 0.5M NaCl soln. at various scan rates (1 mV/s to 20,000 mV/s). The reaction is reversible at the diamond electrode, but the redox kinetics are slow. The results of cyclic voltammetry using submillimeter boron-doped CVD diamond electrode reveal a change in shape of the voltammetric response curve from sigmoidal to peak-shaped as a function of scan rate, reflecting the change in the diffusion layer thickness.

IT **7732-18-5**, Water, **processes**
(electrolysis; hydrogen and oxygen evolution in water electrolysis on boron-doped diamond: ferri-ferrocyanide redox kinetics at submillimeter boron-doped CVD diamond electrode)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT 1333-74-0, Hydrogen, properties 7782-44-7, Oxygen, properties
(evolution in water electrolysis on boron-doped diamond: ferri-ferrocyanide redox kinetics at submillimeter boron-doped CVD diamond electrode)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT 7732-18-5, Water, properties
(hydrogen and oxygen evolution in water electrolysis on boron-doped diamond: ferri-ferrocyanide redox kinetics at submillimeter boron-doped CVD diamond electrode)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 72-2 (Electrochemistry)
Section cross-reference(s): 67, 75
ST cyanoferrate electroredox kinetics boron doped diamond; electrode boron doped diamond cyanoferrate redox; **plasma** CVD boron doped diamond electrode
IT Vapor deposition process
(**plasma**; of boron-doped diamond for electrode for ferri-ferrocyanide redox kinetics)
IT **7732-18-5**, Water, **processes**
(electrolysis; hydrogen and oxygen evolution in water electrolysis on boron-doped diamond: ferri-ferrocyanide redox kinetics at submillimeter boron-doped CVD diamond electrode)
IT **1333-74-0**, Hydrogen, properties **7782-44-7**, Oxygen, properties
(evolution in water electrolysis on boron-doped diamond: ferri-ferrocyanide redox kinetics at submillimeter boron-doped CVD diamond electrode)

IT **7732-18-5**, Water, properties
(hydrogen and oxygen evolution in water electrolysis on boron-doped diamond: ferri-ferrocyanide redox kinetics at submillimeter boron-doped CVD diamond electrode)

L66 ANSWER 19 OF 32 HCA COPYRIGHT 2006 ACS on STN
129:253583 CVD and etching process using **RF** induction **plasma** and apparatus therefor. Okumura, Tomohiro; Tanabe, Hiroshi; Sawada, Kazuyuki; Arai, Koji; Suzuki, Naoki (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10261630 A2 **19980929** Heisei, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-65984 19970319.
AB The process is carried out in a condition where a source (or etching) gas (G1) and a gas (G2) which inhibits deposition of G1 on a dielec. members are flown in a vacuum chamber. The coil, being applied with **RF** power to generate a **plasma**, is arranged along to the dielec. member. Also claimed is the app. for the process. The undesirable adhesion of CVD source or etching gas on the dielec. member is prevented to improve the processing reproducibility.
IT **7732-18-5**, Water, uses **7782-44-7**, Oxygen, uses
(deposition-inhibiting gas; **plasma processing** method and its app. inhibiting film deposition on dielec. substance surface)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **1333-74-0**, Hydrogen, uses **1333-74-0D**, Hydrogen, halide, uses
(etching gas; **plasma** processing method and its app. inhibiting film deposition on dielec. substance surface)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IC ICM H01L021-31
ICS C23C016-52; C23F004-00; H01L021-205; H01L021-285; H01L021-3065
CC 76-14 (Electric Phenomena)
ST CVD etching app **RF** induction **plasma**; dielec coil member source adhesion prevention; argon deposition preventing gas **plasma** app
IT Electric coils
(**plasma** processing method and its app. inhibiting film deposition on dielec. substance surface)
IT Vapor deposition apparatus
(**plasma**; CVD and etching process using **RF** induction **plasma** and app. therefor)
IT Etching apparatus
(**plasma**; **plasma** processing method and its app. inhibiting film deposition on dielec. substance surface)
IT 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7727-37-9, Nitrogen, uses **7732-18-5**, Water, uses **7782-44-7**, Oxygen, uses 10024-97-2, Nitrous oxide, uses
(deposition-inhibiting gas; **plasma processing** method and its app. inhibiting film deposition on dielec. substance surface)
IT 75-10-5, Difluoromethane 75-46-7, Trifluoromethane 75-73-0, Perfluoromethane **1333-74-0**, Hydrogen, uses **1333-74-0D**, Hydrogen, halide, uses 11070-66-9, Perfluorobutene 51311-17-2, Carbon fluoride
(etching gas; **plasma** processing method and its app. inhibiting film deposition on dielec. substance surface)
IT 7631-86-9P, Silica, processes
(**plasma** processing method and its app. inhibiting film deposition on dielec. substance surface)
IT 7440-32-6, Titanium, processes 7440-33-7, Tungsten, processes
(source contg.; **plasma** processing method and its app. inhibiting film deposition on dielec. substance surface)
IT 78-10-4, Tetraethoxysilane
(source; **plasma** processing method and its app. inhibiting film deposition on dielec. substance surface)

L66 ANSWER 20 OF 32 HCA COPYRIGHT 2006 ACS on STN
129:167244 A study on the origin of nonfaradaic behavior of anodic contact **glow discharge** electrolysis, The relationship between power dissipated in **glow discharges** and nonfaradaic yields. Sengupta, Susanta K.; Singh, Rajeshwar; Srivastava, Ashok K. (Department of Chemistry, Faculty of Science, Banaras Hindu University, Varanasi, 221005,

India). Journal of the Electrochemical Society, 145(7), 2209-2213
(English) **1998.** CODEN: JESOAN. ISSN: 0013-4651.
Publisher: Electrochemical Society.

AB Chem. effects of contact **glow discharge** electrolysis (CGDE) at an electrode where a **plasma** is sustained by d.c. **glow discharges** between the electrode and the surrounding electrolyte, are remarkably nonfaradaic. A crit. anal. of the chem. results of anodic CGDE at varying voltages, currents, power supplies, and pHs clearly shows that nonfaradaic yields originate in two sep. reaction zones: the **plasma** around the anode and the liq. anolyte near the **plasma**-anolyte interface. The yields from the former zone appear from 250 V onward (the beginning of the onset of partial **glow discharge**) and vary linearly with the power dissipated in the **glow discharge.** The yields from the latter zone appear from 410 V onward (the beginning of the full **glow discharge**) and are independent of the power dissipated in the **glow discharge.** The relative contribution of the two zones to the total nonfaradaic yields is dependent on the voltage applied: the **plasma** zone having a share of 100% up to 400 V, followed by 20% up to 450 V, and thereafter rising steadily to 57% at 500 V.

IT **7732-18-5**, Water, **processes**
(electrolysis; anodic contact **glow discharge** electrolysis)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0**, Hydrogen, formation (nonpreparative)
7782-44-7, Oxygen, formation (nonpreparative)
(formation in anodic contact **glow discharge** electrolysis in phosphate buffered solns.)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 72-2 (Electrochemistry)

Section cross-reference(s): 76
ST nonfaradaic anodic contact **glow discharge** electrolysis; power dissipation **glow discharge** nonfaradaic yield
IT **Plasma**
(in anodic contact **glow discharge** electrolysis)
IT Electrolysis
Glow discharge
Power
(origin of nonfaradaic behavior of anodic contact **glow discharge** electrolysis: relationship between power dissipated in **glow discharges** and nonfaradaic yields)
IT 1310-58-3, Potassium hydroxide, uses
(anodic contact **glow discharge** electrolysis of phosphate buffered soln. of)
IT 7778-77-0, Monopotassium phosphate
(anodic contact **glow discharge** electrolysis of soln. buffered with)
IT **7732-18-5**, Water, **processes**
(electrolysis; anodic contact **glow discharge** electrolysis)
IT **1333-74-0**, Hydrogen, formation (nonpreparative) 7722-84-1, Hydrogen peroxide, formation (nonpreparative) **7782-44-7**, Oxygen, formation (nonpreparative)
(formation in anodic contact **glow discharge** electrolysis in phosphate buffered solns.)

L66 ANSWER 21 OF 32 HCA COPYRIGHT 2006 ACS on STN
128:194377 Recovery of noble gases from **plasma** display panel sealing furnace. Jain, Ravi; Whitlock, Walter H. (BOC Group, Inc., USA). Eur. Pat. Appl. EP 826629 A2 **19980304**, 14 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1997-305948 19970805. PRIORITY: US 1996-703711 19960827; US 1997-884421 19970627.
AB A noble gas selected from xenon, neon, krypton or their mixts. is recovered from a process chamber by purging the chamber with one of several gases and then sepg. the noble gas from the purge gas by one of several techniques. The sepd. noble gas is further purified to remove trace impurities and is then recycled for reuse in the process chamber. The purge gas may be recycled or disposed of, depending upon the particular purge gas used and its purity. In a specific embodiment, hydrogen is used as the purge gas and it is sepd. from the noble gas by high temp. **membrane** sepn. using a palladium **membrane.** The hydrogen, obtained in high purity, and the noble gas are each recycled for reuse in the

process chamber.
IT **1333-74-0**, Hydrogen, uses **7782-44-7**, Oxygen, uses
(purging gas; in recovery of noble gases from **plasma**
display panel sealing furnace)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM C01B023-00
ICS B01D053-00; B01D053-02; B01D053-22
CC 49-1 (Industrial Inorganic Chemicals)
ST noble gas recovery hydrogen purging; neon recovery hydrogen purging;
xenon recovery hydrogen purging; krypton recovery hydrogen purging;
plasma display panel sealing furnace
IT Hydrocarbons, uses
(C4-6 purging gas; recovery of noble gases from **plasma**
display panel sealing furnace)
IT **Steam**
(purging gas; recovery of noble gases from **plasma**
display panel sealing furnace)
IT Recycling
(recovery of noble gases from **plasma** display panel
sealing furnace)
IT Noble gases, preparation
(recovery of noble gases from **plasma** display panel
sealing furnace)
IT 74-85-1, Ethylene, uses 115-07-1, Propylene, uses 124-38-9,
Carbon dioxide, uses 630-08-0, Carbon monoxide, uses
1333-74-0, Hydrogen, uses 7664-41-7, Ammonia, uses
7782-44-7, Oxygen, uses
(purging gas; in recovery of noble gases from **plasma**
display panel sealing furnace)
IT 7439-90-9P, Krypton, preparation 7440-01-9P, Neon, preparation
7440-63-3P, Xenon, preparation
(recovery of noble gases from **plasma** display panel
sealing furnace)

L66 ANSWER 22 OF 32 HCA COPYRIGHT 2006 ACS on STN
126:311125 Discharge methods and electrodes for generating plasmas at
one atmosphere of pressure, and materials treated therewith.

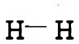
Spence, Paul D. (University of Tennessee Research Corporation, USA).
PCT Int. Appl. WO 9713266 A2 **19970410**, 63 pp.
DESIGNATED STATES: W: AU, BR, CA, CN, DE, DE, IL, JP, KR, RU; RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1996-US20919 19960619. PRIORITY: US 1995-492193 19950619.

AB Two methods and corresponding electrode designs are provided for the generation of a **plasma** at .apprx.1 atm. Using these methods, various webs, films, and 3-dimensional objects, esp. of polymers, are beneficially treated (e.g., to improve wettability or printability) in a reduced amt. of time. A 1st method uses a repetitive, asym. voltage pulse to generate a **plasma** discharge between 2 electrodes. An asym. voltage pulse is used to generate a discharge in which a substrate can be exposed predominantly to either pos. or neg. **plasma** species, depending on the voltage polarity used. A 2nd method uses the gap capacitance of an electrode pair and an external inductor in shunt to form a resonant LC circuit. The circuit is driven by a high-power **radio-frequency** source operating at 1-30 MHz to generate a uniform discharge between the electrode pair. Both methods have temp.-controlled discharge surfaces with supply gas temp., humidity, and flow rate control. The gas flow is typically sufficient to cause a turbulent flow field in the discharge region where materials are treated. Electrode pairs implement these methods and include a metal-faced electrode and a dielec.-covered electrode, 1 or both of which have holes extending through the electrode face for supply gas flow. The 2nd of the above-described methods will also operate with paired, metal-faced electrodes, but under more restricted operating conditions.

IT **1333-74-0**, Hydrogen, processes **7782-44-7**, Oxygen, processes
(app. for generating plasmas for surface treatment of)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)



RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

IT **7732-18-5, Water, processes**
(**vapor**; app. for generating plasmas for surface treatment of)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IC ICM H01J
CC 76-11 (Electric Phenomena)
Section cross-reference(s): 38
ST discharge electrode method **plasma** generation; polymer **plasma** treatment
IT Electrodes
Plasma
(discharge methods and electrodes for generating plasmas for surface treatment)
IT 124-38-9, Carbon dioxide, processes **1333-74-0**, Hydrogen, processes 7440-37-1, Argon, processes 7440-59-7, Helium, processes 7664-41-7, Ammonia, processes 7727-37-9, Nitrogen, processes **7782-44-7**, Oxygen, processes 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9003-53-6, Polystyrene 9010-79-1, Ethylene-propylene copolymer 24968-12-5, Polybutylene terephthalate 25038-59-9, processes 26062-94-2, Polybutylene terephthalate
(app. for generating plasmas for surface treatment of)
IT **7732-18-5, Water, processes**
(**vapor**; app. for generating plasmas for surface treatment of)

L66 ANSWER 23 OF 32 HCA COPYRIGHT 2006 ACS on STN
125:97909 The wall conditioning techniques in RFX. Sonato, P.; Baker, W. R.; Fiorentin, P.; Marchiori, G.; Zaccaria, P.; Zollino, G.; Antoni, V.; Bagatin, M.; Desideri, D.; et al. (Gruppo di Padova per ricerche sulla Fusione, EURATOM-ENEA-CNR-Universita di Padova, Padua, 35127, Italy). Vacuum, 47(6-8, Proceedings of the 13th International Vacuum Congress and the 9th International Conference on Solid Surfaces, 1995), 977-980 (English) **1996.** CODEN: VACUAV. ISSN: 0042-207X. Publisher: Elsevier.
AB The vacuum of RFX has a total vol. of 10 m3 and a surface exposed to the vacuum of 40 m2. It is completely covered with 2016 graphite tiles. The following wall conditioning techniques are applied: baking up to 350°, GDC and PDC in H2 and He. Moreover, in order to reduce Zeff in the **plasma** discharge, a GDC assisted deposition of a film contg. boron has been carried out. The effectiveness is assessed by means of mass spectrometers and by silicon samples exposed to the processes. In this paper, after a brief description of the wall conditioning techniques, the main results are reported and compared.
IT **1333-74-0**, Hydrogen, uses
(**glow** and pulse **discharge** cleaning as wall

conditioning techniques for the RFX reversed field pinch)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7732-18-5**, Water, **processes 7782-44-7**, Oxygen, processes
(wall conditioning techniques used in the RFX reversed field pinch in relation to)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 71-2 (Nuclear Technology)
ST reversed field pinch wall conditioning RFX; fusion reactor wall conditioning RFX; pulse discharge cleaning wall conditioning pinch; baking wall conditioning reversed field pinch; **glow discharge** cleaning wall conditioning pinch; boronization wall conditioning reversed field pinch
IT Cleaning
(**glow discharge**, wall conditioning techniques for the RFX reversed field pinch)
IT **1333-74-0**, Hydrogen, uses 7440-59-7, Helium, uses
(**glow** and pulse **discharge** cleaning as wall conditioning techniques for the RFX reversed field pinch)
IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes **7732-18-5**, Water, **processes 7782-44-7**, Oxygen, processes
(wall conditioning techniques used in the RFX reversed field pinch in relation to)

L66 ANSWER 24 OF 32 HCA COPYRIGHT 2006 ACS on STN
124:71363 Process-induced damage to SRAM poly-load resistance during photoresist ashing in H2O **plasma.** Chang, Kuang-Hui; Huang, Yuang-Chang; Lin, Ting-Hwang; Chang, Chaur-Rong (Taiwan Semiconductor Manufacturing Company, Hsin Chu, Taiwan). Proceedings of SPIE-The International Society for Optical Engineering, 2635, 276-83 (English) **1995.** CODEN: PSISDG. ISSN: 0277-786X.

AB Process-induced damage to SRAM (static-RAM) poly-load resistance have been clearly obsd. during photoresist ashing in an H2O **plasma** which is commonly used as an effective corrosion-prevented treatment after metal etching in a chlorine rich environment. The resistance degraded to about three order in the H2O **plasma** than in the conventional O2 **plasma.** Different ratios of H2O to O2 **plasma** have been studied by using the well-designed pattern to understand the basic mechanisms of the problems which occurred in the photoresist ashing process. Exptl. results showed that the higher concn. of H2O, the more damage to the SRAM products, resulting in the lower resistance of poly-load. Different types of **plasma** sources (**microwave** and inductively coupled plasmas) for H2O- **plasma** photoresist ashing process have also been investigated and found that the damage effects to SRAM poly-load resistance in the inductive-type **plasma** source (such as Transformer Coupled **Plasma**) is more severe than that in the **microwave**-type **plasma** at the similar operation conditions. This may because inductive-type **plasma** has higher degree of ionization which generated more hydrogen ions inside the H2O **plasma.**

IT **1333-74-0**, Hydrogen, processes
(**plasma**; process-induced damage to SRAM poly-load resistance during photoresist ashing in water **plasma**)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7732-18-5**, Water, **processes 7782-44-7**, Oxygen, processes
(**plasma; process**-induced damage to SRAM poly-load resistance during photoresist ashing in water **plasma**)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and

Other Reprographic Processes)
ST photoresist ashing water **plasma** SRAM
IT Resists
(photo-, process-induced damage to SRAM poly-load resistance during photoresist ashing in water **plasma**)
IT Memory devices
(random-access, static; process-induced damage to SRAM poly-load resistance during photoresist ashing in water **plasma**)
IT **1333-74-0**, Hydrogen, processes
(**plasma**; process-induced damage to SRAM poly-load resistance during photoresist ashing in water **plasma**)
IT 75-73-0, Carbon tetrafluoride **7732-18-5**, Water, **processes** **7782-44-7**, Oxygen, processes
(**plasma**; **process**-induced damage to SRAM poly-load resistance during photoresist ashing in water **plasma**)

L66 ANSWER 25 OF 32 HCA COPYRIGHT 2006 ACS on STN
122:108344 Surface modification of cis-1,4-polybutadiene with halocarbon plasmas and gas permeability of the **membrane.** Zhang, Liangren; Jin, Daosen; Tisato, Kajiyama (Lanzhou Inst. Chem. Phys., Acad. Sin., Lanzhou, 730000, Peop. Rep. China). Gaofenzi Xuebao (6), 660-6 (Chinese) **1993.** CODEN: GAXUE9. ISSN: 1000-3304.
AB The surface modification of cis-1,4-polybutadiene **membrane** was studied using CF2Cl2, CF2ClCF2Cl, and CF4 **plasma** treatments. The **plasma**-treated composite **membrane** was investigated by SEM, measurement of static contact angle to water, and XPS. Gas permeability of the **membrane** was also measured.
IT **7732-18-5**, Water, properties
(contact angle of water to cis-1,4-polybutadiene with surface modified by halocarbon plasmas and gas permeability of **membrane**)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0**, Hydrogen, properties **7782-44-7**, Oxygen, properties
(surface modification of cis-1,4-polybutadiene with halocarbon plasmas and gas permeability of **membrane**)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

CC 39-12 (Synthetic Elastomers and Natural Rubber)
IT Contact angle
(contact angle of water to cis-1,4-polybutadiene with surface modified by halocarbon plasmas and gas permeability of **membrane**)
IT Permeability and Permeation
(gas permeability of cis-1,4-polybutadiene composite **membrane** with surface modified by halocarbon plasmas)
IT **Plasma**
Surface
(surface modification of cis-1,4-polybutadiene with halocarbon plasmas and gas permeability of **membrane**)
IT Rubber, butadiene, properties
(of cis-1,4-configuration, surface modification of cis-1,4-polybutadiene with halocarbon plasmas and gas permeability of **membrane**)
IT **7732-18-5**, Water, properties
(contact angle of water to cis-1,4-polybutadiene with surface modified by halocarbon plasmas and gas permeability of **membrane**)
IT 9003-17-2
(rubber, of cis-1,4-configuration, surface modification of cis-1,4-polybutadiene with halocarbon plasmas and gas permeability of **membrane**)
IT 124-38-9, Carbon dioxide, properties 630-08-0, Carbon monoxide, properties **1333-74-0**, Hydrogen, properties 7727-37-9, Nitrogen, properties **7782-44-7**, Oxygen, properties
(surface modification of cis-1,4-polybutadiene with halocarbon plasmas and gas permeability of **membrane**)
IT 9003-17-2
(surface modification of cis-1,4-polybutadiene with halocarbon plasmas and gas permeability of **membrane**)
IT 75-73-0, Tetrafluoromethane 76-14-2, 1,2-Dichloro-1,1,2,2-tetrafluoroethane
(surface modification of cis-1,4-polybutadiene with halocarbon plasmas and gas permeability of **membrane**)
IT 75-71-8, Dichlorodifluoromethane
(surface modification of cis-1,4-polybutadiene with halocarbon

plasmas and gas permeability of the **membrane**)

L66 ANSWER 26 OF 32 HCA COPYRIGHT 2006 ACS on STN
122:85486 Gas **plasma**-treated solid polymer electrolyte **membrane** for fuel cell and fuel cell including this **membrane.** Binder, Michael; Mammone, Robert J. (United States Dept. of the Army, USA). U.S. US 5372896 A **19941213**, 3 pp. (English). CODEN: USXXAM. APPLICATION: US 1993-123652 19930920.

AB A perfluorosulfonate **membrane** is exposed for .apprx.8 min to a gas **plasma** prior to inclusion in a fuel cell as a separator between a liq. or gaseous fuel and an oxidant.

IT **1333-74-0**, Hydrogen, uses **7732-18-5**, Water, uses **7782-44-7**, Oxygen, uses
(fuel-cell perfluorosulfonate electrolyte **membrane** gas **plasma** treated with)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM H01M008-10
INCL 429033000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST fuel cell polymer electrolyte **membrane**; gas **plasma** treatment electrolyte **membrane**; perfluorosulfonate **membrane** gas **plasma** treatment

IT Electric conductivity and conduction
(ionic, of gas **plasma**-treated fuel-cell perfluorosulfonate electrolyte **membranes**)

IT Fuel cells
(separators, gas **plasma**-treated perfluorosulfonate **membrane** for)

IT 75-73-0, Tetrafluoromethane 124-38-9, Carbon dioxide, uses

1333-74-0, Hydrogen, uses 7440-59-7, Helium, uses
7446-09-5, Sulfur dioxide, uses 7664-41-7, Ammonia, uses
7732-18-5, Water, uses **7782-44-7**, Oxygen, uses
10024-97-2, Nitrogen oxide (N2O), uses 10028-15-6, Ozone, uses
(fuel-cell perfluorosulfonate electrolyte **membrane** gas **plasma** treated with)

IT 66796-30-3, Nafion 117
(gas **plasma**-treated fuel-cell electrolyte **membrane** of)

L66 ANSWER 27 OF 32 HCA COPYRIGHT 2006 ACS on STN

121:12419 Manufacture of semipermeable polymer **membranes.**
Gadkaree, Kishor Purushottam; Hersch, Leroy S. (Corning, Inc., USA). Eur. Pat. Appl. EP 595201 A2 **19940504**, 10 pp.
DESIGNATED STATES: R: DE, FR, GB. (English). CODEN: EPXXDW.
APPLICATION: EP 1993-117068 19931021. PRIORITY: US 1992-968661 19921030.

AB The title microporous polymer **membranes**, useful as a sepn. **membrane** or the like, are prepd. by extruding a melt-blended mixt. of a high-temp. thermoplastic polymer and a leachable glass to form sheet and leaching the glass from the sheet to leave a microporous relict polymer network. The permeability of the sheet is improved by **plasma**-etching the surface of the sheet before or after leaching. Hydrophilic or hydrophobic porous **membranes** may be provided.

IT **1333-74-0**, Hydrogen, uses **7732-18-5**, Water, uses
7782-44-7, Oxygen, uses
(**plasma**, in manuf. of semipermeable microporous polymer **membranes**)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IC ICM B01D067-00

ICS B01D069-00
CC 47-2 (Apparatus and Plant Equipment)
Section cross-reference(s): 38, 57, 61
ST polymer **membrane** semipermeable manuf; glass leachable polymer **membrane** manuf; **plasma** etching polymer **membrane** manuf
IT Polysulfones, uses
(**membranes**, semipermeable microporous, manuf. of, leachable glass and **plasma** etching in)
IT Sputtering
(etching, in manuf. of semipermeable microporous polymer **membranes**)
IT Glass, oxide
(phosphate, leachable, in manuf. of semipermeable microporous polymer **membranes**)
IT Polyethers, uses
(polyamide-, **membranes**, semipermeable microporous, manuf. of, leachable glass and **plasma** etching in)
IT Polyamides, uses
Polyketones
(polyether-, **membranes**, semipermeable microporous, manuf. of, leachable glass and **plasma** etching in)
IT Polyethers, uses
(polyketone-, **membranes**, semipermeable microporous, manuf. of, leachable glass and **plasma** etching in)
IT **Membranes**
(semipermeable, polymer, manuf. of microporous, leachable glass and **plasma** etching in)
IT Etching
(sputter, in manuf. of semipermeable microporous polymer **membranes**)
IT 1303-86-2, Boron oxide, uses 1344-28-1, Aluminum oxide (Al2O3), uses 7646-85-7, Zinc chloride (ZnCl2), uses
(leachable phosphate glass contg., in manuf. of semipermeable microporous polymer **membranes**)
IT **1333-74-0**, Hydrogen, uses 7664-41-7, Ammonia, uses **7732-18-5**, Water, uses **7782-44-7**, Oxygen, uses 10024-97-2, Nitrogen oxide (N2O), uses
(**plasma**, in manuf. of semipermeable microporous polymer **membranes**)

L66 ANSWER 28 OF 32 HCA COPYRIGHT 2006 ACS on STN
113:60252 Low pressure **plasma** chemistry in the Institute of Chemistry, Academia Sinica. Chen, Guanwen (Inst. Chem., Acad. Sin., Beijing, Peop. Rep. China). Proceedings of Japanese Symposium on Plasma Chemistry, 2, 231-8 (English) **1989**. CODEN: PJPCE9. ISSN: 0915-1699.
AB O mols. from air **plasma** were incorporated into

polypropylene-supported **plasma**-prepd. hexamethyldisiloxane polymers (I), 4-methyl-1-pentene polymers (II), octamethylcyclotetrasiloxane polymers (III), vinylmethyldiethylsilane polymers (IV), and vinyltrimethylsilane polymers (V) creating highly crosslinked polymer **membranes**. N-O sepns. by supported **plasma**-prepd. I, III, IV, and V **membranes** were greater than those by solvent-cast **membranes.** H-N sepns. by supported **plasma**-prepd. II **membranes** were greater than those by solvent-cast **membranes** at 25-75°. The wettabilities of supported **plasma**-prepd. poly(2-hydroxyethyl methacrylate), poly(N-vinylpyrrolidone), and III **membranes** increased as the O content of the **membrane** surfaces increased with increasing polymn. time. The reactivity of carbon fibers towards epoxy resin increased as the surface concn. of polar functional groups increased due to O-**plasma** etching.

IT **1333-74-0**, Hydrogen, properties **7782-44-7**, Oxygen, properties
(sepn. of, from nitrogen, by polypropylene-supported **plasma**-prepd. polymer **membranes**)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O═O

IT **7732-18-5**
(wettability, of **plasma**-prepd. poly(hydroxyethyl methacrylate) and poly(vinylpyrrolidone) and poly(octamethylcyclotetrasiloxane) **membranes** on polypropylene, polymn. time and surface oxygen content in relation to)

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

CC 36-5 (Physical Properties of Synthetic High Polymers)
Section cross-reference(s): 35

ST **plasma** polymer **membrane** gas permeability;
siloxane **plasma** **membrane** gas permeability;

silane polymer **membrane** gas permeability; polymethylpentene **plasma membrane** gas permeability; wettability **plasma** polymer **membrane** ; polyhydroxyethyl methacrylate **plasma membrane** wettability; polyvinylpyrrolidone **plasma membrane** wettability; carbon fiber reactivity **plasma** etching

IT **Plasma**, chemical and physical effects
    (air, polymn. by, of hydrophilic and hydrophobic and organosilicon monomers, oxygen content and wettability in relation to)

IT Wettability
    (of **plasma**-prepd. poly(hydroxyethyl methacrylate) and poly(vinylpyrrolidone) and poly(octamethylcyclotetrasiloxane) **membranes** on polypropylene, polymn. time and surface oxygen content in relation to)

IT Permeability and Permeation
    (of polypropylene-supported **plasma**-prepd. polymer **membranes**, to hydrogen and nitrogen and oxygen)

IT **Membranes**
    (polymeric, polypropylene-supported, **plasma**-prepd., gas permeability and wettability of)

IT Siloxanes and Silicones, uses and miscellaneous
    (polypropylene-supported **plasma**-prepd. **membranes** of, gas separability and surface wettability of)

IT Epoxy resins, uses and miscellaneous
    (reactivity of carbon fibers with, effect of oxygen-**plasma** etching of fiber surfaces on)

IT Carbon fibers, properties
    (reactivity of, with epoxy resin, effect of oxygen-**plasma** etching of fiber surfaces on)

IT Functional groups
    (oxygen-contg., on carbon fibers and polypropylene-supported **plasma**-prepd. polymer **membranes**, surface reactivity and wettability in relation to)

IT Polymerization
    (**plasma**, of hydrophilic and hydrophobic and organosilicon monomers, on polypropylene **membranes**, oxygen content and wettability in relation to)

IT 7440-44-0
    (carbon fibers, reactivity of, with epoxy resin, effect of oxygen-**plasma** etching of fiber surfaces on)

IT 25068-26-2, 4-Methyl-1-pentene homopolymer
    (**plasma**-prepd. **membranes** of, on polypropylene, oxygen atoms and crosslinking in, hydrogen and nitrogen gas separability in relation to)

IT 25036-32-2 26298-61-3, Hexamethyldisiloxane homopolymer 105218-98-2, Vinylmethyldiethylsilane homopolymer

(**plasma**-prepd. **membranes** of, on polypropylene, oxygen atoms and crosslinking in, nitrogen and oxygen gas separability in relation to)

IT 25037-57-4, Octamethylcyclotetrasiloxane homopolymer
(**plasma**-prepd. **membranes** of, on polypropylene, oxygen atoms and crosslinking in, wettability and nitrogen and oxygen separability in relation to)

IT 9003-39-8, N-Vinylpyrrolidone homopolymer 25249-16-5, 2-Hydroxyethyl methacrylate homopolymer
(**plasma**-prepd. **membranes** of, on polypropylene, wettability of)

IT 9003-07-0
(**plasma**-prepd. polymer **membranes** supported on, hydrogen and nitrogen and oxygen sepn. by)

IT 128418-38-2, SB 1
(reaction of, with carbon fibers, effect of oxygen-**plasma** treatment of fiber surfaces on)

IT 7727-37-9, Nitrogen, properties
(sepn. of, from hydrogen or oxygen, by polypropylene-supported **plasma**-prepd. polymer **membranes**)

IT **1333-74-0**, Hydrogen, properties **7782-44-7**, Oxygen, properties
(sepn. of, from nitrogen, by polypropylene-supported **plasma**-prepd. polymer **membranes**)

IT **7732-18-5**
(wettability, of **plasma**-prepd. poly(hydroxyethyl methacrylate) and poly(vinylpyrrolidone) and poly(octamethylcyclotetrasiloxane) **membranes** on polypropylene, polymn. time and surface oxygen content in relation to)

L66 ANSWER 29 OF 32 HCA COPYRIGHT 2006 ACS on STN

108:122946 Formation of functional tin oxide thin films by **plasma** chemical vapor deposition. Fushimi, Masahiro; Shimizu, Isamu (Canon K. K., Japan). Jpn. Kokai Tokkyo Koho JP 62278268 A2 **19871203** Showa, 5 (Japanese). CODEN: JKXXAF. APPLICATION: JP 1986-120152 19860527.

AB The title process is carried out by activation of volatile Sn compds., oxidizing gases, and H(g) by simultaneous irradn. of the gases with the same activation source. The films are useful as transparent electrodes, permselective **membranes** (no data), etc. Thus, a **plasma** was formed using a gas mixt. of $SnCl_4$, O, H, and He to deposit a 1-μ SnO_2 film on a glass substrate. The film showed surface resistivity 10 kΩ and light transmittance >80%.

IT **7732-18-5**, Water, reactions **7782-44-7**, Oxygen, reactions
(**plasma** contg., with hydrogen and volatile tin compds.,

transparent conductive tin dioxide film deposition from)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **1333-74-0**, Hydrogen, reactions
(**plasma** contg., with volatile tin compds. and oxidizing gases, conductive tin dioxide film deposition from)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IC ICM C23C016-40
ICS C23C016-50; G02F001-133; H01B013-00; H01L021-28; H01L031-04
CC 76-2 (Electric Phenomena)
Section cross-reference(s): 42, 49, 75
ST tin oxide conductive transparent film; **plasma** chem vapor deposition film
IT 7646-78-8, Tin tetrachloride, reactions
(**plasma** contg., with hydrogen and oxidizing gases, transparent conductive tin dioxide film deposition from)
IT **7732-18-5**, Water, reactions **7782-44-7**, Oxygen, reactions
(**plasma** contg., with hydrogen and volatile tin compds., transparent conductive tin dioxide film deposition from)
IT **1333-74-0**, Hydrogen, reactions
(**plasma** contg., with volatile tin compds. and oxidizing gases, conductive tin dioxide film deposition from)
IT 18282-10-5P, Tin dioxide
(thin films, transparent, elec. conductive, manuf. of, by **plasma** chem. vapor deposition)

L66 ANSWER 30 OF 32 HCA COPYRIGHT 2006 ACS on STN
108:97109 Study of the **membrane** method of carbon monoxide separation from a carbon dioxide-carbon monoxide-oxygen mixture in a plasmachemical carbonic acid cycle for hydrogen production from water. Vasil'ev, Yu. B.; Kozhevnikov, V. Yu.; Krotov, M. F.; Parovichnikov, A. I.; Sivakov, A. A.; Tyunin, A. N.; Urvachev, N. A.

(USSR). Vopr. Atom. Nauki i Tekhn. Atom.-vodorod. Energ. i Tekhnol., Moskva (2), 50-2 From: Ref. Zh., Khim. 1987, Abstr. No. 21L140 (Russian) **1987.**

AB Title only translated.

IT **7782-44-7**, Oxygen, uses and miscellaneous
(carbon monoxide sepn. from carbon dioxide and, in hydrogen manuf. from water by plasmachem. cycle)

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **7732-18-5**, Water, uses and miscellaneous
(hydrogen manuf. from, in plasmachem. cycle, carbon monoxide **membrane** sepn. from carbon dioxide and oxygen in)

RN 7732-18-5 HCA

CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

IT **1333-74-0P**, Hydrogen, preparation
(manuf. of, from water by plasmachem. cycle, carbon monoxide **membrane** sepn. from carbon dioxide and oxygen in)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

CC 49-1 (Industrial Inorganic Chemicals)

ST hydrogen manuf water plasmachem cycle; carbon monoxide sepn **membrane**

IT **Plasma**, chemical and physical effects
(water decompn. in, hydrogen manuf. by, carbon monoxide sepn. from carbon dioxide and oxygen in)

IT **7782-44-7**, Oxygen, uses and miscellaneous
(carbon monoxide sepn. from carbon dioxide and, in hydrogen manuf. from water by plasmachem. cycle)

IT **7732-18-5**, Water, uses and miscellaneous
(hydrogen manuf. from, in plasmachem. cycle, carbon monoxide **membrane** sepn. from carbon dioxide and oxygen in)

IT **1333-74-0P**, Hydrogen, preparation
(manuf. of, from water by plasmachem. cycle, carbon monoxide **membrane** sepn. from carbon dioxide and oxygen in)

IT 630-08-0P, Carbon monoxide, preparation
(sepn. of, from carbon dioxide and oxygen by **membrane**

in hydrogen manuf. from water by plasmachem. cycle)

L66 ANSWER 31 OF 32 HCA COPYRIGHT 2006 ACS on STN
107:29514 Basic processes in **glow discharge** plasmas.
Venugopalan, M. (Dep. Chem., West. Illinois Univ., Macomb, IL, 61455, USA). Nuclear Instruments & Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms, B23(4), 405-17 (English) **1987.** CODEN: NIMBEU. ISSN: 0168-583X.

AB A review with 62 refs. in which the d.c. and **radio-frequency glow discharge** plasmas are described in terms of their evolution, mechanism, spatial characteristics, and voltage-current relation. The basic **plasma** processes, such as excitation, ionization/dissocn. and recombination are reviewed using examples of the chem. reactive H2 + O2/H2O and N2 +/NH3 plasmas. This is followed by a discussion of some of the heterogeneous processes occurring at the walls and substrates, namely film formation, etching, nitriding and analogous reactions.

IT **1333-74-0**, Hydrogen, properties **7732-18-5**, **Water, vapor** **7782-44-7**, Oxygen, properties
(**plasma** contg., basic **processes** in **glow discharge** plasmas in relation to)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA
CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

CC 71-0 (Nuclear Technology)
Section cross-reference(s): 76

ST review **glow discharge plasma**; fusion **plasma glow discharge** review

IT Nuclear fusion reactor fuels and plasmas
(erosion by, basic processes in **glow discharge** plasmas in relation to)

IT Coating process
(**glow discharge plasma** basic
process in relation to)
IT **Plasma**
Plasma, chemical and physical effects
(**glow-discharge**)
IT Erosion
(of fusion reactor materials, basic processes in **glow**
discharge plasmas in relation to)
IT Nuclear fusion reactors
(first walls, erosion of, basic processes in **glow**
discharge in relation to)
IT **1333-74-0**, Hydrogen, properties 7664-41-7, Ammonia,
properties 7727-37-9, Nitrogen, properties **7732-18-5**,
Water, vapor 7782-44-7, Oxygen,
properties
(**plasma** contg., basic **processes** in
glow discharge plasmas in relation to)

L66 ANSWER 32 OF 32 HCA COPYRIGHT 2006 ACS on STN
98:205876 Preliminary design of a fusion reactor fuel cleanup system by
the palladium-alloy **membrane** method. Yoshida, Hiroshi;
Konishi, Satoshi; Naruse, Yuji (Div. Thermonucl. Fus. Res., Japan
At. Energy Res. Inst., Tokai, Japan). Nuclear Technology/Fusion,
3(3), 471-84 (English) **1983.** CODEN: NTFUDQ. ISSN:
0272-3921.
AB A design for a Pd diffuser and fuel cleanup system for a D-T fusion
reactor is proposed. The feasibility of the Pd-alloy
membrane method is discussed based on earlier studies.
Operating conditions of the Pd diffuser were detd. exptl.
Dimensions of the diffuser were estd. from computer simulation. A
fuel cleanup system is designed under the feed conditions of the
Tritium Systems Test Assembly at Los Alamos National Lab. The
system is composed of Pd diffusers, catalytic oxidizer, freezer, and
Zn beds and has some advantages in system layout and operation.
This design can readily be extended to other conditions of
plasma exhaust gases.
IT **7732-18-5**, uses and miscellaneous **7782-44-7**, uses
and miscellaneous
(palladium alloy **membrane** method for cleanup of fusion
reactor fuel system contg.)
RN 7732-18-5 HCA
CN Water (8CI, 9CI) (CA INDEX NAME)

H_2O

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT **1333-74-0**, properties
(permeability of, in palladium alloy **membrane** system
for fusion reactor fuel cleanup)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

CC 71-2 (Nuclear Technology)
ST fusion reactor fuel cleanup; palladium **membrane** fuel
cleanup
IT **Membranes**
(palladium alloy, in nuclear fusion reactor fuel cleanup system)
IT Nuclear fusion reactors
(fuels and plasmas, palladium alloy **membrane** method for
cleanup of)
IT Palladium alloy, base
(**membrane**, in nuclear fusion reactor fuel cleanup
system)
IT 74-82-8, uses and miscellaneous 124-38-9, uses and miscellaneous
630-08-0, uses and miscellaneous 7664-41-7, uses and miscellaneous
7727-37-9, uses and miscellaneous **7732-18-5**, uses and
miscellaneous **7782-44-7**, uses and miscellaneous
(palladium alloy **membrane** method for cleanup of fusion
reactor fuel system contg.)
IT 10028-17-8, uses and miscellaneous
(palladium-alloy **membrane** system for cleanup of fusion
reactor fuel contg.)
IT **1333-74-0**, properties 7782-39-0, properties
(permeability of, in palladium alloy **membrane** system
for fusion reactor fuel cleanup)

=> D HIS L67-

FILE 'HCA' ENTERED AT 14:30:44 ON 20 DEC 2006
L67 25797 S L3 (L) RACT/RL
L68 1345 S L13 AND L14 AND L67
L69 25 S L68 AND L25
L70 2 S L69 NOT (L63 OR L64 OR L65 OR L66)
L71 0 S L70 AND 1840-2003/PRY,PY